EFJohnson® TECHNOLOGIES | Product Catalog

Effective Date | August 2012

a smarter way to P25™

EF Johnson Technologies, Inc.

EFJohnson knows a smarter way to P25, and we are eager to share it with you. As your one-stop resource for P25, our new leadership team is completely focused on delivering the highest quality, cost-effective mission critical communications solutions.

Customers

- First responders in public safety and public service
- Federal government
- State and local government
- Military

Company Profile

- Corporate headquarters are in Irving, TX
- Satellite offices in Waseca, Mn and Lincoln, NE
- Approximately 200 employees

New Direction

In 2010, EF Johnson Technologies, Inc. was acquired by Francisco Partners, one of the world's largest technology focused private equity funds, pursuing structured investments in technology companies undergoing strategic, technological, and operational inflection points. The privatization of the company has resulted in gaining the necessary resources to further the pursuit of the company's vision of innovating, developing and manufacturing the highest quality mission critical communications solutions. Andrew Adams, the company's president and CEO, joined the company in 2010 and has built a leadership team that is focused on quality and outstanding customer service and support

History of EFJohnson

1923 E.F. Johnson Company was founded

1939 First public safety product was manufactured

1980 First company to introduce trunked systems for public safety

1998 Founding member of P25 Technology Interest Group

2005 Introduced distributed architecture system for P25

a smarter way to P25™

P25 Solutions

Systems

Smarter system design makes EFJohnson's ATLAS P25 System Solutions the most reliable, cost-efficient option available in the communications marketplace. Our patented, distributed architecture eliminates the need for a large, expensive central controller and makes the system resilient enough to withstand multiple points of communication failure without affecting the rest of the system. With plug-and-play deployments capable of supporting hybrid system configurations, ATLAS is a smarter option for users who want to start small and grow as their capacity and budget expands.

Portable/Mobile Two Way Radios

MADE IN U.S.A.

Our award-winning radios are used throughout the world by military, police, fire, paramedics, and homeland security personnel. We were the first supplier to implement the AMBE+2 vocoder into our radios for superior digital sound. Our radios have remarkable versatility because of their interoperability with Project 25 trunked and conventional modes, APCO 16 Motorola SMARTNET®/ SmartZone®, and an upgrade capability for Project 25 Phase 2 TDMA.

VIKING VP600

Smarter engineering makes EFJohnson's new Viking™ VP600 portable radio a reliable option that is easy to operate. We listened to our end-users and created a rugged radio that offers effortless communications in even the most hazardous environments. With P25 Phase 2 capabilities, superior audio and advanced visual features, the Viking™ VP600 is a value-packed, high-quality option for first responders.

Management Team

Andrew Adams
President & CEO

Jana Ahlfinger Bell
Executive VP & CFO

Jim Green
Chief Operating Officer

Jim Cleveland
Senior VP, Sales

Karthik Rangarajan
VP, Marketing & Product Management

Tom LaHoda
VP, Channel & Partnership Development

?006
First manufacturer to ship AMBE+2 P25 vocoder in entire product line

2009
StarGate™ Dispatch Console introduced

2010
51Fire ES introduced - first portable designed specifically for firefighters

2011
ATLAS™ P25 system solutions introduced

2012
Viking™ VP600 portable radio introduced

EFJohnson® TECHNOLOGIES

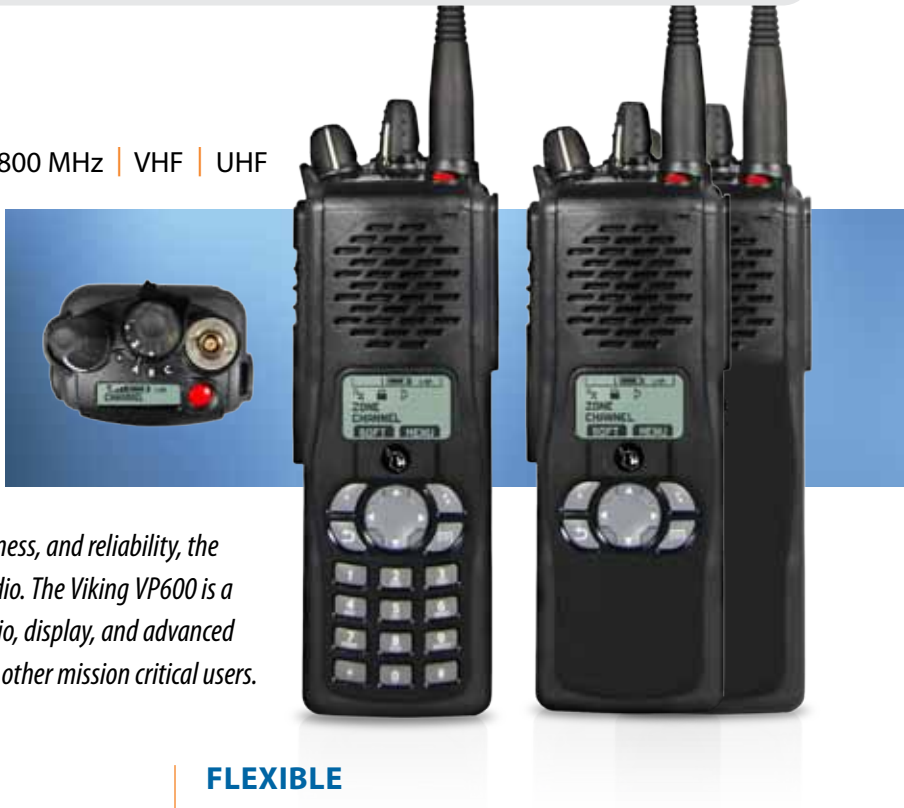
EFJohnson TECHNOLOGIES | Portable Radios

EFJohnson's Viking™ portfolio offers products catering to mission critical communication systems. Viking P25 subscribers offer a broad set of capabilities to fully meet the communication needs of our customer networks with interoperability, reliability, and maximum flexibility.

Viking™ VP600

7/800 MHz | VHF | UHF

With a top display and 2.5 Watts of max audio, the VP600 portable offers smarter visual and audio features that make first responder communications effortless.



Designed for outstanding mission critical performance, ruggedness, and reliability, the Viking VP600 is the next generation of EFJohnson's portable radio. The Viking VP600 is a P25 Phase 2 capable radio equipped with industry leading audio, display, and advanced feature capabilities that meet the needs of police, fire, EMS and other mission critical users.

EASY TO OPERATE

- The VP600 is available in three different model variants with no keypad, limited keypad or full keypad versions
- The VP600 offers the top display on all three model variants that maximizes viewing while in holster
- Backlit displays with controllable settings to increase visibility in all lighting conditions
- Backlit keypad
- Equipped with multiple visual indicators including battery level and signal strength to check status at a glance
- Ergonomic knobs for easier operation with gloves

RUGGED & RELIABLE

- Meets MIL Standard 810 G specs
- Immersion rated (IP67) *(waterproof in 1 meter of water up to 30 minutes)*

SUPERIOR AUDIO QUALITY

- High performance speaker provides 2.5W audio *(1W nominal)* for loud and clear sound across various noise environments
- State of the art AMBE+2 version 1.6 vocoder using TIA's latest standards

P25 COMPLIANT

- Supports P25 CAI (Common Air Interface)
- Trunked and conventional system protocols
- Over-the-Air rekeying (OTAR) functionality

FLEXIBLE

- A future proof investment with P25 Phase 2 capability
- Programmable soft keys, menu and DTMF keys
- Up to 1024 channels
- Text messaging for P25 Conventional
- Supports narrowband (12.5 kHz) & wideband (25 kHz) channel spacing with multiple system protocols
- Industry-standard encryption capabilities such as AES and DES-OFB
- Voice announcement
- Armada™ programming software provides fleet management of radios as well as profile templates
- Enhanced radio security using software and hardware system keys

MULTI-PROTOCOL/MULTI-MODE CAPABILITY

- Compatible with Motorola® System v 7.x, Motorola Astro® and SMARTNET® II/SmartZone®
- MDC-1200 and GE-Star signaling

ACCESSORY SUITE

- Complete line of accessories including speaker mics, cases, batteries, antennas, and chargers

AMBE+2 ENHANCED DIGITAL VOCODER

P25 DIGITAL WIRELESS

MADE IN U.S.A.

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TYPICAL PERFORMANCE SPECIFICATIONS

Viking VP600 7/800 MHz | VHF | UHF

GENERAL	700/800	VHF	UHF
Frequency Range	762-806 MHz 806-870 MHz	136-174 MHz	380-470 MHz
Channel Spacing	12.5 kHz, 25 kHz[1]		
Max Freq. Separation	Full Bandsplit		
FCC Type Acceptance Certification	ATH2425770	ATH2425710 (Pending)	ATH2425720 (Pending)
Canada Type Certification	IC:933B-2425770	IC:933B-2425710 (P)	IC:933B-24275720 (P)
FCC Emissions Designators	16K0F3E, 14K0F3E, 11K0F3E, 8K10F1D, 8K10F1E	11K0F3E, 8K10F1D, 8K10F1E	11K0F3E, 8K10F1D, 8K10F1E
Input Voltage	7.4 V		
Dimensions (w/o antenna) HxWxD	7.5″ x 2.62″ x 1.75″		
Weight (w/o standard battery)	12.2 oz		
Case	Polycarbonate-black		
Temperature Range	-30°C to +60°C		
Vocoder/Noise Cancellation	AMBE+2 version 1.6 | AMBE+2 noise cancellation and audio enhancement		
Programmable Front Display	Backlit LCD | Status Bar (time, date, signal strength, battery level), icon or text display options Up to 5 rows of 12 character lines		
Programmable Top Display	Backlit LCD | Status Bar (time, date, signal strength, battery level) or text display options Up to 2 rows of 12 character lines		

Transmitter	700/800	VHF	UHF
RF Power Output	2.5/3 W	5 W	4 W
Frequency Stability (-30°C to +60°C)	1.5 ppm		
Modulation Limiting 25 kHz Channels	5 kHz[1]		
Modulation Limiting 12.5 kHz Channels	2.5 kHz		
Emissions (Conducted/Radiated)	75 dBc		
Audio Response	+1 , -3 dB		
FM Hum and Noise 25 kHz Channels	45 dB[1]		
FM Hum and Noise 12.5 kHz Channels	39 dB		
Audio Distortion	3%		

Receiver	700/800	VHF	UHF
Audio Power Output	1 W rated | 2.5 W Max		
Frequency Stability (-30°C to +60°C)	1.5 ppm		
Analog Mode Sensitivity: 12 dB SINAD	-119 dBm		
Digital Mode Sensitivity: 5% BER	-119 dBm		
Selectivity: 25 kHz Channels	75 dB[1]		
Selectivity: 12.5 kHz Channels	60 dB		
Intermodulation	75 dB		
Spurious & Image Rejection	80 dB		
FM Hum and Noise 25 kHz Channels	40 dB[1]		
FM Hum and Noise 12.5 kHz Channels	34 dB		
Audio Distortion	3%		

Note 1: 25 kHz mode is not available in US FCC frequencies in 700 MHz, UHF or VHF.

Battery	Dimensions (HxWxD)	Weight	Approx. Life (5/5/90)
High Capacity Lithium Ion (3780 mA hours nominal)	6.5″ x 2.3″ x .78″	8.1 oz	10 hours

Specifications are measured per TIA 102.CAAA-C, TIA 102.CAAB-C and per TIA 603-D.
All EFJohnson radios are made in the U.S.A.

Environmental Specifications

Environment	Mil Spec	810G
	M	P
Low Pressure	500.5	II
High Temp.	501.5	II
Low Temp.	502.5	II
Temp. Shock	503.5	I-D
Solar Radiation	505.5	I
Rain/Blown Rain	506.5	I
Humidity	507.5	I
Salt Fog	509.5	NA
Dust and Sand	510.5	I
Vibration	514.6	I
Shock	516.6	VI, V
Immersion	512.5	I

M=Method, P=Procedure
Also meets equivalent superseded C, D, E, and F standards.
Immersion meets IEC 529 IP67

Encryption Options

Supported Encryption	AES, DES-OFB
Encryption Key/ Radio	126 Common Key Reference (CKR), 126 Physical Identifier, (PID), Compatible w/ Motorola Key Variable Loader
Encryption Frame Re-sync Interval	P25 CAI 360 MSEC
Encryption Keying	External Key Loader, OTAR
Mode	OFB-Output Feedback
Encryption Type	Digital
Key Erasure	Keyboard Command
Standards	FIPS 46-3, FIPS 81, FIPS 140-2, FIPS 197

All specifications are subject to change without notice.
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EFJohnson TECHNOLOGIES

EFJohnson's Viking™ Solution portfolio offers products catering to mission critical communication systems. Viking P25 subscribers offer a broad set of capabilities to fully meet the communication needs of our customer networks with interoperability, reliability, and maximum flexibility.

51FIRE ES

7/800 MHz | VHF | UHF

Designed and engineered specifically for firefighters, the award-winning 51FIRE ES features standard yellow housing and blade knobs for ease of operation even with fire gloves.

FLEXIBLE

- Both round & blade knobs are included
- Compatible with Motorola® System v 7.x and Motorola Astro®
- SMARTNET® II/SmartZone® interoperability
- Up to 512 talkgroups
- Supports narrowband (12.5 kHz) & wideband (25 kHz) channel spacing with multiple system protocols
- MDC-1200 and GE-Star signaling
- Over-the-Air programming (OTAP) option enables you to program radios in the field
- Industry-standard encryption capabilities such as AES, DES-OFB, and DES
- Easy radio programming & feature updating with EFJohnson's PC Configure™ software

P25 COMPLIANT

- Supports P25 CAI (Common Air Interface)
- Trunked and conventional system protocols
- Over-the-Air rekeying (OTAR) functionality

ACCESSORY SUITE

- Complete line of accessories including speaker mics, cases, batteries, and chargers

RUGGED & RELIABLE

- Aluminum casting & polycarbonate housing is strong, yet lightweight
- Meets applicable MIL Standard 810 C, D, E, and F specs
- FM intrinsically safe
- Immersible to a depth of 1 meter for 30 minutes *(per MIL Spec 810F & IP67 standards)*
- AMBE+2 P25 vocoder significantly enhances audio quality and clarity in high noise environments (upgrade to the AMBE+2 v1.6 to reduce background noise even more when a PASS alarm is sounding)

OPTIONAL FIRESAFE™ SOFTWARE

- Set & Forget
- Evacuation Alert
- Visual & Audible Range Indicator
- Out of Range Alert
- IP25™ System "Heartbeat"
- P25 Auto Switch
- Com Check

AMBE+2 ENHANCED DIGITAL VOCODER

P25 DIGITAL WIRELESS • SANTE FULL HUMAN RESCUE • UNALAMBRICO DIGITAL

MADE IN U.S.A.

www.efjohnson.com | EFJohnson TECHNOLOGIES

51FIRE ES 7/800 MHz | UHF | VHF

TYPICAL PERFORMANCE SPECIFICATIONS

GENERAL	700/800	VHF	UHF
Frequency Range	762-806 MHz 806-870 MHz	136-174 MHz	380-470 MHz
Channel Spacing	12.5 kHz, 25 kHz		
Max Freq. Separation	Full Bandsplit		
FCC Type Acceptance Certification	ATH2425171	ATH2425111	ATH2425131
Canada Type Certification	IC:933B-2425171	IC:933B-2425112	IC:933B-2425131
FCC Emissions Designators	11K0F3E, 16KOF3E, 14K0F3E, 8K10F1E, 8K10F1D	16K0F3E, 11K0F3E, 8K10F1E, 8K10F1D	16K0F3E, 11K0F3E, 8K10F1E, 8K10F1D
Input Voltage	7.2 V		
Dimensions (w/o antenna) HxWxD	6.7" x 2.52" x 1.8" (6.4 cm x 17.0 cm x 4.6 cm)		
Weight (w/o standard battery)	11 oz. (312 g)		
Case	Polycarbonate-yellow | Immersion rated option available for all housings		
Temperature Range	-30°C to +60°C		
Vocoder	AMBE+2		

Transmitter	700/800	VHF	UHF
RF Power Output	2.5/1 W (700 MHz) 3/1 W (800 MHz)	5/1 W	4/1 W
Frequency Stability (-30°C to +60°C)	±1.5 ppm		
Modulation Limiting 25 kHz Channels	±5 kHz		
Modulation Limiting 12.5 kHz Channels	±2.5 kHz		
Emissions (Conducted/Radiated)	-75 dBc		
Audio Response	+1 , -3 dB		
FM Hum and Noise 25 kHz Channels	-40 dB	-45 dB	
FM Hum and Noise 12.5 kHz Channels	-35 dB	-40 dB	
Audio Distortion	2%		

Receiver	700/800	VHF	UHF
Audio Power Output	500 mW		
Frequency Stability (-30°C to +60°C)	±1.5 ppm		
Analog Mode Sensitivity: 12 dB SINAD	0.25 uV (-119 dBm)		
Digital Mode Sensitivity: 5% BER	0.25 uV (-119 dBm)		
Selectivity: 25 kHz Channels	-75 dB		
Selectivity: 12.5 kHz Channels	-63 dB		
Intermodulation	-75 dB		
Spurious & Image Rejection	-75 dB		
FM Hum and Noise 25 kHz Channels	-40 dB		
FM Hum and Noise 12.5 kHz Channels	-35 dB		
Audio Distortion	2%		

Battery	Dimensions (HxWxD)	Weight	Approx. Life (5/5/90)
Extra-High Capacity NiMH, IS	6.0" x 2.3" x 0.85"	12.96 oz	UHF/VHF: Minimum 10 hours 700/800 MHz: Minimum 12 hours

Specifications are measured per TIA 102.CAA-B, TIA 102.CAAB-B and per TIA 603-C.
All EFJohnson radios are made in the U.S.A.

Environmental Specifications

Environment	Mil Spec	810F
	M	P
Low Pressure	500.4	II
High Temp.	501.4	I, II
Low Temp.	502.4	I, II
Temp. Shock	503.4	I
Solar Radiation	505.4	I
Rain/Blown Rain	506.4	I, III
Humidity	507.4	NA
Salt Fog	509.4	NA
Dust and Sand	510.4	I
Vibration	514.5	I (24)
Shock	516.5	I, IV
Immersion*	512.4	I

M=Method, P=Procedure, *=Optional
Also meets equivalent superseded C, D and E standards.

Encryption Options

Supported Encryption	AES, DES, DES-OFB
Encryption Key/ Radio	64 Common Key Reference (CKR), 64 Physical Identifier, (PID), Compatible w/ Motorola Key Variable Loader
Encryption Frame Re-sync Interval	P25 CAI 360 MSEC
Encryption Keying	External Key Loader, OTAR
Synchronization	CFB-Cipher Feedback OFB-Output Feedback
Vector Generator	National Institute of Standards and Technology (NIST) Approved random number generator
Encryption Type	Digital
Key Erasure	Keyboard Command
Code Key Initialization	Internal Pseudorandom Generator
Standards	FIPS 46-3, FIPS 81, FIPS 140-2, FIPS 197

Factory Mutual Approvals

Intrinsically Safe		
Class I/ Class II	Division 1 An area where there is or could be an explosive atmosphere most of the time in normal conditions.	C. Ethylene D. Propane and Methane E. Conductive metal F. Carbonaceous material coal, coke dust G. Grain dust and flour
Class III	Division 1 Location in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.	Ignitable fibers or flyings
Non-Incendive		
Class I	Division 2 An area where an explosive atmosphere exists only as a result of a fault.	A. Acetylene B. Hydrogen C. Ethylene D. Propane and Methane

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EFJohnson TECHNOLOGIES

The Award-Winning 51FIRE ES

Designed for Firefighters, Engineered for Safety.

- Round & Blade Knobs Included
- Immersible IP-67
- Large PTT (Push to Talk) Button
- Standard Yellow Housing
- MDC-1200 & GE-Star Signaling
- Factory Mutual Intrinsically Safe

P25 | I | FM APPROVED | MADE IN U.S.A.

RECESSED EMERGENCY BUTTON

This critical, life-saving feature is large and flush with the housing so it will not easily trigger false alarms.

AMBE+2 ENHANCED DIGITAL VOCODER

SUPERIOR DIGITAL AUDIO

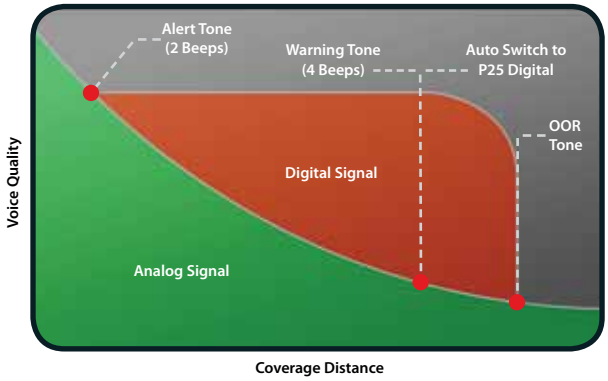
The AMBE+2 P25 vocoder significantly enhances audio quality and clarity in high noise environments (upgrade to the AMBE+2 v1.6 to reduce background noise even more when a PASS alarm is sounding).

FIRESafe™ Software Features

SET & FORGET

Common Problem: Firefighters are on the wrong channel and/or the volume is too low. Radio could be accidentally turned off.

EFJohnson Solution: Enabling the Fireground mode of operation is as easy as pressing a single button and ensures that firefighters do not inadvertently lose communications with command. The keypad and channel selector are locked as well as the volume level, and the radio cannot be turned off.



EVACUATION ALERT

Common Problem: Firefighters miss an evacuation call.

EFJohnson Solution: Firefighters receive a loud alert tone when an evacuation alert is received from a command radio. Digital signaling has a higher likelihood of being received because it is a short burst, repeatable data message.

P25 AUTO SWITCH

Common Problem: When nearing the out of range threshold, analog transmissions are very unclear.

EFJohnson Solution: The radio automatically switches to digital mode when analog transmissions become unclear (4 beeps), extending coverage range. Once transmissions become clear enough (2 beeps), the radio will automatically switch back to analog mode.

OUT OF RANGE ALERT WITH VISUAL AND AUDIBLE RANGE INDICATOR

Common Problem: Firefighters do not know when they are out of communication range.

EFJohnson Solution: A visual RSSI is acceptable, however an audible RSSI enhances awareness and safety. Two warning tones are emitted when the RSSI level drops below a predefined threshold to alert the firefighter that he is at the threshold of radio coverage. Four tones warn of impending communication loss. If the firefighter moves out of range, he will receive a visual and audible alert tone. Additionally, the firefighter can quickly depress a button to perform a communications check to determine the strength of his signal.

P25 Digital Heartbeat
P25 Digital Messaging (Radio can be in analog or P25 digital mode)

EFJohnson's Viking™ Solution portfolio offers products catering to mission critical communication systems. Viking P25 subscribers offer a broad set of capabilities to fully meet the communication needs of our customer networks with interoperability, reliability, and maximum flexibility.

51SL ES

7/800 MHz | VHF | UHF

Durable and interoperable P25 portable radio for public safety, featuring the AMBE+2 vocoder which provides loud and clear digital audio.

RUGGED & RELIABLE

- Lightweight aluminum casting & polycarbonate housing is strong and has optional immersion rating
- Meets applicable MIL Standard 810C, D, E, and F specs
- FM intrinsically safe

P25 COMPLIANT

- Supports P25 CAI (Common Air Interface)
- Trunked and conventional system protocols
- Over-the-Air rekeying (OTAR) functionality

ACCESSORY SUITE

- Complete line of accessories including speaker mics, cases, batteries, and chargers

FLEXIBLE

- Compatible with Motorola® System v 7.x and Motorola Astro®
- SMARTNET® II/SmartZone® interoperability
- Up to 512 talkgroups
- Supports narrowband (12.5 kHz) & wideband (25 kHz) channel spacing with multiple system protocols
- MDC-1200 and GE-Star signaling
- Over-the-Air programming (OTAP) option enables you to program radios in the field
- Industry-standard encryption capabilities such as AES, DES-OFB, and DES
- Easy radio programming & feature updating with EFJohnson's PC Configure™ software

AMBE+2 ENHANCED DIGITAL VOCODER

P25 DIGITAL • DIGITAL WIRELESS • SAME AS ANALOG • INTEROPERABLE

MADE IN U.S.A.

www.efjohnson.com | EFJohnson TECHNOLOGIES

TYPICAL PERFORMANCE SPECIFICATIONS

51SL ES 7/800 MHz | UHF | VHF

GENERAL	700/800	VHF	UHF
Frequency Range	762-806 MHz 806-870 MHz	136-174 MHz	380-470 MHz
Channel Spacing	12.5 kHz, 25 kHz		
Max Freq. Separation	Full Bandsplit		
FCC Type Acceptance Certification	ATH2425171	ATH2425111	ATH2425131
Canada Type Certification	IC:933B-2425171	IC:933B-2425112	IC:933B-2425131
FCC Emissions Designators	11K0F3E, 16KOF3E, 14K0F3E, 8K10F1E, 8K10F1D	16K0F3E, 11K0F3E, 8K10F1E, 8K10F1D	16K0F3E, 11K0F3E, 8K10F1E, 8K10F1D
Input Voltage	7.2 V		
Dimensions (w/o antenna) HxWxD	6.7" x 2.52" x 1.8" (6.4 cm x 17.0 cm x 4.6 cm)		
Weight (w/o standard battery)	11 oz. (312 g)		
Case	Polycarbonate-black | Immersion rated option available for all housings		
Temperature Range	-30°C to +60°C		
Vocoder	AMBE+2		

Transmitter	700/800	VHF	UHF
RF Power Output	2.5/1 W (700 MHz) 3/1 W (800 MHz)	5/1 W	4/1 W
Frequency Stability (-30°C to +60°C)	±1.5 ppm		
Modulation Limiting 25 kHz Channels	±5 kHz		
Modulation Limiting 12.5 kHz Channels	±2.5 kHz		
Emissions (Conducted/Radiated)	-75 dBc		
Audio Response	+1 , -3 dB		
FM Hum and Noise 25 kHz Channels	-40 dB	-45 dB	
FM Hum and Noise 12.5 kHz Channels	-35 dB	-40 dB	
Audio Distortion	2%		

Receiver	700/800	VHF	UHF
Audio Power Output	500 mW		
Frequency Stability (-30°C to +60°C)	±1.5 ppm		
Analog Mode Sensitivity: 12 dB SINAD	0.25 uV (-119 dBm)		
Digital Mode Sensitivity: 5% BER	0.25 uV (-119 dBm)		
Selectivity: 25 kHz Channels	-75 dB		
Selectivity: 12.5 kHz Channels	-63 dB		
Intermodulation	-75 dB		
Spurious & Image Rejection	-75 dB		
FM Hum and Noise 25 kHz Channels	-40 dB		
FM Hum and Noise 12.5 kHz Channels	-35 dB		
Audio Distortion	2%		

Battery	Dimensions (HxWxD)	Weight	Approx. Life (5/5/90)
Extra-High Capacity NiMH	6.0" x 2.3" x 0.85"	12.96 oz	UHF/VHF: Minimum 10 hours 700/800 MHz: Minimum 12 hours
Extra-High Capacity NiMH, IS	6.0" x 2.3" x 0.85"	12.96 oz	UHF/VHF: Minimum 10 hours 700/800 MHz: Minimum 12 hours
Lithium Polymer	6.2" x 2.3" x .81"	7.9 oz	UHF/VHF: Minimum 10 hours 700/800 MHz: Minimum 12 hours

Specifications are measured per TIA 102.CAA-B, TIA 102.CAAB-B and per TIA 603-C.
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Environmental Specifications

Environment	Mil Spec	810F
	M	P
Low Pressure	500.4	II
High Temp.	501.4	I, II
Low Temp.	502.4	I, II
Temp. Shock	503.4	I
Solar Radiation	505.4	I
Rain/Blown Rain	506.4	I, III
Humidity	507.4	NA
Salt Fog	509.4	NA
Dust and Sand	510.4	I
Vibration	514.5	I (24)
Shock	516.5	I, IV
Immersion*	512.4	I

M=Method, P=Procedure, *=Optional
Also meets equivalent superseded C, D and E standards.

Encryption Options

Supported Encryption	AES, DES, DES-OFB
Encryption Key/ Radio	64 Common Key Reference (CKR), 64 Physical Identifier, (PID), Compatible w/ Motorola Key Variable Loader
Encryption Frame Re-sync Interval	P25 CAI 360 MSEC
Encryption Keying	External Key Loader, OTAR
Synchronization	CFB-Cipher Feedback OFB-Output Feedback
Vector Generator	National Institute of Standards and Technology (NIST) Approved random number generator
Encryption Type	Digital
Key Erasure	Keyboard Command
Code Key Initialization	Internal Pseudorandom Generator
Standards	FIPS 46-3, FIPS 81, FIPS 140-2, FIPS 197

Factory Mutual Approvals

Intrinsically Safe		
Class I/ Class II	Division 1 An area where there is or could be an explosive atmosphere most of the time in normal conditions.	C. Ethylene D. Propane and Methane E. Conductive metal F. Carbonaceous material coal, coke dust G. Grain dust and flour
Class III	Division 1 Location in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.	Ignitable fibers or flyings
Non-Incendive		
Class I	Division 2 An area where an explosive atmosphere exists only as a result of a fault.	A. Acetylene B. Hydrogen C. Ethylene D. Propane and Methane

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EFJohnson TECHNOLOGIES

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5100 ES

7/800 MHz | VHF | UHF

Featuring AES encryption and the AMBE+2 vocoder which provides loud and clear audio, the 5100 ES portable radio is durable and interoperable.

RUGGED & RELIABLE

- Lightweight aluminum casting & polycarbonate housing is strong and has optional immersion rating
- Meets applicable MIL Standard 810 C, D, E, and F specs
- FM intrinsically safe

P25 COMPLIANT

- Supports P25 CAI (Common Air Interface)
- Trunked and conventional system protocols
- Over-the-Air rekeying (OTAR) functionality

ACCESSORY SUITE

- Complete line of accessories including speaker mics, cases, batteries, and chargers

FLEXIBLE

- Compatible with Motorola® System v 7.x and Motorola Astro®
- SMARTNET® II/SmartZone® interoperability
- Up to 864 talkgroups
- Supports narrowband (12.5 kHz) & wideband (25 kHz) channel spacing with multiple system protocols
- MDC-1200 and GE-Star signaling
- Over-the-Air programming (OTAP) option enables you to program radios in the field
- Industry-standard encryption capabilities such as AES, DES-OFB, and DES
- Easy radio programming & feature updating with EFJohnson's PC Configure™ software

AMBE+2 ENHANCED DIGITAL VOCODER

P25 DIGITAL WIRELESS • SANTE FULL RUGGEDIZED • UNALTERABLE

MADE IN U.S.A.

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TYPICAL PERFORMANCE SPECIFICATIONS

5100 ES 7/800 MHz | UHF | VHF

GENERAL	700/800	VHF	UHF
Frequency Range	762-806 MHz 806-870 MHz	136-174 MHz	380-470 MHz
Channel Spacing	12.5 kHz, 25 kHz		
Max Freq. Separation	Full Bandsplit		
FCC Type Acceptance Certification	ATH2425171	ATH2425111	ATH2425131
Canada Type Certification	IC:933B-2425171	IC:933B-2425112	IC:933B-2425131
FCC Emissions Designators	11K0F3E, 16KOF3E, 14K0F3E, 8K10F1E, 8K10F1D	16K0F3E, 11K0F3E, 8K10F1E, 8K10F1D	16K0F3E, 11K0F3E, 8K10F1E, 8K10F1D
Input Voltage	7.2 V		
Dimensions (w/o antenna) HxWxD	6.7" x 2.52" x 1.8" (6.4 cm x 17.0 cm x 4.6 cm)		
Weight (w/o standard battery)	11 oz. (312 g)		
Case	Polycarbonate-black, yellow | Immersion rated option available for all housings		
Temperature Range	-30°C to +60°C		
Vocoder	AMBE+2		

Transmitter	700/800	VHF	UHF R1
RF Power Output	2.5/1 W (700 MHz) 3/1 W (800 MHz)	5/1 W	4/1 W
Frequency Stability (-30°C to +60°C)	±1.5 ppm		
Modulation Limiting 25 kHz Channels	±5 kHz		
Modulation Limiting 12.5 kHz Channels	±2.5 kHz		
Emissions (Conducted/Radiated)	-75 dBc		
Audio Response	+1 , -3 dB		
FM Hum and Noise 25 kHz Channels	-40 dB	-45 dB	
FM Hum and Noise 12.5 kHz Channels	-35 dB	-40 dB	
Audio Distortion	2%		

Receiver	700/800	VHF	UHF R1
Audio Power Output	500 mW		
Frequency Stability (-30°C to +60°C)	±1.5 ppm		
Analog Mode Sensitivity: 12 dB SINAD	0.25 uV (-119 dBm)		
Digital Mode Sensitivity: 5% BER	0.25 uV (-119 dBm)		
Selectivity: 25 kHz Channels	-75 dB		
Selectivity: 12.5 kHz Channels	-63 dB		
Intermodulation	-75 dB		
Spurious & Image Rejection	-75 dB		
FM Hum and Noise 25 kHz Channels	-40 dB		
FM Hum and Noise 12.5 kHz Channels	-35 dB		
Audio Distortion	2%		

Battery	Dimensions (HxWxD)	Weight	Approx. Life (5/5/90)
Extra-High Capacity NiMH	6.0" x 2.3" x 0.85"	12.96 oz	UHF/VHF: Minimum 10 hours 700/800 MHz: Minimum 12 hours
Extra-High Capacity NiMH, IS	6.0" x 2.3" x 0.85"	12.96 oz	UHF/VHF: Minimum 10 hours 700/800 MHz: Minimum 12 hours
Lithium Polymer	6.2" x 2.3" x .81"	7.9 oz	UHF/VHF: Minimum 10 hours 700/800 MHz: Minimum 12 hours

Specifications are measured per TIA 102.CAA-B, TIA 102.CAAB-B and per TIA 603-C.
All EFJohnson radios are made in the U.S.A.

Environmental Specifications

Environment	Mil Spec	810F
	M	P
Low Pressure	500.4	II
High Temp.	501.4	I, II
Low Temp.	502.4	I, II
Temp. Shock	503.4	I
Solar Radiation	505.4	I
Rain/Blown Rain	506.4	I, III
Humidity	507.4	NA
Salt Fog	509.4	NA
Dust and Sand	510.4	I
Vibration	514.5	I (24)
Shock	516.5	I, IV
Immersion*	512.4	I

M=Method, P=Procedure, *=Optional
Also meets equivalent superseded C, D and E standards.

Encryption Options

Supported Encryption	AES, DES, DES-OFB
Encryption Key/ Radio	64 Common Key Reference (CKR), 64 Physical Identifier, (PID), Compatible w/ Motorola Key Variable Loader
Encryption Frame Re-sync Interval	P25 CAI 360 MSEC
Encryption Keying	External Key Loader, OTAR
Synchronization	CFB-Cipher Feedback OFB-Output Feedback
Vector Generator	National Institute of Standards and Technology (NIST) Approved random number generator
Encryption Type	Digital
Key Erasure	Keyboard Command
Code Key Initialization	Internal Pseudorandom Generator
Standards	FIPS 46-3, FIPS 81, FIPS 140-2, FIPS 197

Factory Mutual Approvals

Intrinsically Safe		
Class I/ Class II	Division 1 An area where there is or could be an explosive atmosphere most of the time in normal conditions.	C. Ethylene D. Propane and Methane E. Conductive metal F. Carbonaceous material coal, coke dust G. Grain dust and flour
Class III	Division 1 Location in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.	Ignitable fibers or flyings
Non-Incendive		
Class I	Division 2 An area where an explosive atmosphere exists only as a result of a fault.	A. Acetylene B. Hydrogen C. Ethylene D. Propane and Methane

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EFJohnson TECHNOLOGIES

EFJohnson's Viking™ Solution portfolio offers products catering to mission critical communication systems. Viking P25 subscribers offer a broad set of capabilities to fully meet the communication needs of our customer networks with interoperability, reliability, and maximum flexibility.

AN/PRC127EFJ

UHF | VHF

The AN/PRC127EFJ radio provides tactical and secure AES, intra-squad communications at the lowest echelons for Counterinsurgency Operations Command and Control.

NSN: 5820-01-567-6589
UHF Model

NSN: 5820-01-567-6582
VHF Model

COMBAT LAND MOBILE RADIO (CLMR)

- Lightweight aluminum casting & polycarbonate housing is strong and has immersion rating (IP67 Standard)
- Meets applicable MIL Standard 810C, D, E, and F specs
- JF 12 Certified
- FM intrinsically safe (VHF radios only)

FLEXIBLE

- Supports narrowband (12.5 kHz) & wideband (25 kHz) channel spacing with multiple system protocols
- Industry-standard encryption capabilities such as AES, DES-OFB, DES, and FIPS 140-2
- Easy radio programming & feature updating with EFJohnson's PC Configure™ software

P25 COMPLIANT

- Supports P25 CAI (Common Air Interface)
- Trunked and conventional system protocols
- Over-the-Air rekeying (OTAR) functionality

ACCESSORY SUITE

- Complete line of accessories including speaker mics, cases, NiMH and Li-Ion batteries, and chargers

AMBE+2 ENHANCED DIGITAL VOCODER

P25 DIGITAL WIRELESS

MADE IN U.S.A.

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TYPICAL PERFORMANCE SPECIFICATIONS

AN/PRC127EFJ UHF | VHF

GENERAL	VHF	UHF R1
Frequency Range	136-174 MHz	380-470 MHz
Channel Spacing	12.5 kHz, 25 kHz	
Max Freq. Separation	Full Bandsplit	
FCC Type Acceptance Certification	ATH2425111	ATH2425131
Canada Type Certification	IC:933B-2425112	IC:933B-2425131
FCC Emissions Designators	16K0F3E, 11K0F3E, 8K10F1E, 8K10F1D	16K0F3E, 11K0F3E, 8K10F1E, 8K10F1D
Input Voltage	7.2 V	
Dimensions (w/o antenna) HxWxD	6.7″ x 2.52″ x 1.8″ (6.4 cm x 17.0 cm x 4.6 cm)	
Weight (w/o standard battery)	11 oz. (312 g)	
Case	Polycarbonate-black | Immersion rated option available for all housings	
Temperature Range	-30°C to +60°C	
Vocoder	AMBE+2	

Transmitter	VHF	UHF R1
RF Power Output	5/1 W	4/1 W
Frequency Stability (-30°C to +60°C)	±1.5 ppm	
Modulation Limiting 25 kHz Channels	±5 kHz	
Modulation Limiting 12.5 kHz Channels	±2.5 kHz	
Emissions (Conducted/Radiated)	-75 dBc	
Audio Response	+1 , -3 dB	
FM Hum and Noise 25 kHz Channels	-45 dB	
FM Hum and Noise 12.5 kHz Channels	-40 dB	
Audio Distortion	2%	

Receiver	VHF	UHF R1
Audio Power Output	500 mW	
Frequency Stability (-30°C to +60°C)	±1.5 ppm	
Analog Mode Sensitivity: 12 dB SINAD	0.25 uV (-119 dBm)	
Digital Mode Sensitivity: 5% BER	0.25 uV (-119 dBm)	
Selectivity: 25 kHz Channels	-75 dB	
Selectivity: 12.5 kHz Channels	-63 dB	
Intermodulation	-75 dB	
Spurious & Image Rejection	-75 dB	
FM Hum and Noise 25 kHz Channels	-40 dB	
FM Hum and Noise 12.5 kHz Channels	-35 dB	
Audio Distortion	2%	

Battery	Dimensions (HxWxD)	Weight	Approx. Life (5/5/90)
Extra-High Capacity NiMH	6.0″ x 2.3″ x 0.85″	12.96 oz	UHF/VHF: Minimum 10 hours 700/800 MHz: Minimum 12 hours
Extra-High Capacity NiMH, IS	6.0″ x 2.3″ x 0.85″	12.96 oz	UHF/VHF: Minimum 10 hours 700/800 MHz: Minimum 12 hours
Alkaline Battery Clamshell	7.2″ x 2.6″ x 2.0″	15.68 oz w/12 AA Battery	14-16 hours
High Capacity Lithium Ion	6.5″ x 2.3″ x .78″	8.1 oz	12 hours

Specifications are measured per TIA 102.CAA-B, TIA 102.CAAB-B and per TIA 603-C.
All EFJohnson radios are made in the U.S.A.

Environmental Specifications

Environment	Mil Spec	810F
	M	P
Low Pressure	500.4	II
High Temp.	501.4	I, II
Low Temp.	502.4	I, II
Temp. Shock	503.4	I
Solar Radiation	505.4	I
Rain/Blown Rain	506.4	I, III
Humidity	507.4	NA
Salt Fog	509.4	NA
Dust and Sand	510.4	I
Vibration	514.5	I (24)
Shock	516.5	I, IV
Immersion*	512.4	I

M=Method, P=Procedure, *=Optional
Also meets equivalent superseded C, D and E standards.

Encryption Options

Supported Encryption	AES, DES, DES-OFB
Encryption Key/ Radio	64 Common Key Reference (CKR), 64 Physical Identifier, (PID), Compatible w/ Motorola Key Variable Loader
Encryption Frame Re-sync Interval	P25 CAI 360 MSEC
Encryption Keying	External Key Loader, OTAR
Synchronization	CFB-Cipher Feedback OFB-Output Feedback
Vector Generator	National Institute of Standards and Technology (NIST) Approved random number generator
Encryption Type	Digital
Key Erasure	Keyboard Command
Code Key Initialization	Internal Pseudorandom Generator
Standards	FIPS 46-3, FIPS 81, FIPS 140-2, FIPS 197

Factory Mutual Approvals

Intrinsically Safe		
Class I/ Class II	Division 1 An area where there is or could be an explosive atmosphere most of the time in normal conditions.	C. Ethylene D. Propane and Methane E. Conductive metal F. Carbonaceous material coal, coke dust G. Grain dust and flour
Class III	Division 1 Location in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.	Ignitable fibers or flyings
Non-Incendive		
Class I	Division 2 An area where an explosive atmosphere exists only as a result of a fault.	A. Acetylene B. Hydrogen C. Ethylene D. Propane and Methane

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EFJohnson TECHNOLOGIES

EFJohnson's Viking™ Solution portfolio offers products catering to mission critical communication systems. Viking P25 subscribers offer a broad set of capabilities to fully meet the communication needs of our customer networks with interoperability, reliability, and maximum flexibility.

Subscriber Management Assistant (SMA)

The EFJohnson Subscriber Management Assistant (SMA) is a versatile and ruggedized tool that allows for fast and easy encryption keyloading.

Available in a ruggedized case, the SMA connects to an EFJohnson radio via a serial interface for configuration and key management. It uses the FIPS 140 certified SEM security algorithms for all security functions, including AES and DES. With its Microsoft Windows® based graphical user interface, the SMA will have you configuring your radios right away.

KEY FEATURES

- Create, download, and erase multiple keys simultaneously
- Supports FIPS 140 certified AES and DES encryption keys
- Supports multiple key databases for fleet management
- Also compatible with EFJohnson's Key Management Facility (KMF) and JEM 2 Encryption cards

SMA KIT INCLUDES

- SMA keyloader
- Rugged shock-proof casing with belt clip attachment
- Keyloader software
- Compact Flash to serial port adapter cable

Note: Must purchase optional programming cable. See the required accessories table on the reverse page for details.

TECHNICAL DATA

Subscriber Management Assistant (SMA)

SYSTEM FEATURES	
Device	Socket® SoMo® 650DX Handheld Computer
Operating System	Windows Mobile 6 Classic
Processor	Marvell PXA270 @ 624 MHz

MEMORY	
Available Memory	128 MB SDRAM
Flash Memory	1 GB or 256 MB NAND Flash

AUDIO, SLOTS, AND PORTS	
Ports	Barrel connector power jack
	USB 1.1 Host & USB 2.0 Client
	26 pin connector for ActiveSync
	2.5mm headset jack with support for voice and stereo music
Slots	Compact Flash (CF) and Secure Digital I/O (SDIO) slots: Reinforced to prevent damage when dropped

GRAPHICS AND INPUT/OUTPUT DEVICES	
Input Devices	Stylus (Note: touch sensitive display for stylus or fingertip)

SOFTWARE	
Microsoft Pre-Installed Software	Microsoft ActiveSync, OneNote Mobile, MSN Messenger
Socket Software	SocketScan™, SoMo 650 Back Pack Utilities, Power Plus Battery Friendly®, Hold Switch, CPU performance, Modem, Ethernet Utility
Key Management Software	EFJohnson Key Set Creation and Management Application

PRODUCT SPECIFICATIONS	
Dimensions (H x W x D)	5.0" x 2.94" x 0.81"
Weight	6.25 oz with battery and stylus

REQUIRED ACCESSORIES	
Cable	Portable keyloading cable: PN 023-5000-940
	Mobile keyloading cable: PN 023-5000-950

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EFJohnson® TECHNOLOGIES

EFJohnson TECHNOLOGIES | Programming Software

EFJohnson's Viking™ portfolio offers products catering to mission critical communication systems. Viking P25 subscribers offer a broad set of capabilities to fully meet the communication needs of our customer networks with interoperability, reliability, and maximum flexibility.

ARMADA™

Armada Fleet Management Software enables quick and efficient configuration of Viking radios.

FUNCTIONALITY

- Quickly access all radio profiles
- Maintain offline records of each radio's properties
- Templates apply changes to many radios at once
- Cloning wizard automatically assigns IDs

DISPLAY

- Programmable front and top display offers choice of date, time, signal strength, and battery
- Preview display as it looks on the radio

INTUITIVE USER INTERFACE

- Tabbed navigation
- Easily switch between radios
- No more endless dialogs

COMPUTER REQUIREMENTS

- Windows XP, Windows Vista, or Windows 7
- 1.2 GHz Pentium processor (or greater)
- 512 MB RAM
- 100 MB hard disk space
- CD-ROM drive
- USB 2.0 port

VERSIONING

- One version of Armada for all Viking radios
- Maintain your fleet over many years with one application

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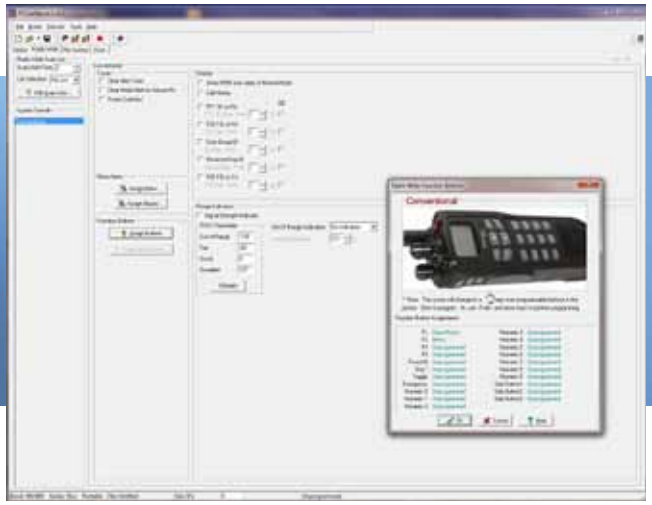
EFJohnson TECHNOLOGIES

EFJohnson's Viking™ portfolio offers products catering to mission critical communication systems. Viking P25 subscribers offer a broad set of capabilities to fully meet the communication needs of our customer networks with interoperability, reliability, and maximum flexibility.

PC Configure™

PC Configure programs EFJohnson's ES portable and mobile radios easily and quickly with the same software package.



Program all of your EFJohnson mobile and portable radios quickly and easily with minimal setup time or training, PC Configure gives you the flexibility to program your EFJohnson portable or mobile radios for any encryption or system type installed on the radio. PC Configure is a Windows®-based application. With its intuitive and unique graphical display, PC Configure allows you to re-reflash radios much faster than any other radio programming software. PC Configure's "remember" function stores previously programmed parameters (such as software version or options) and recalls them for future use.

KEY FEATURES & BENEFITS

- Minimize your learning curve with an intuitive graphical interface
- Configure mobile and portable radios with a single software package
- Switch between radio and system parameters, and program zone and channel properties with the click of a mouse
- Program your radios in analog conventional, Multi-Net®, Project 25 conventional and trunking, and SMARTNET®/SmartZone®
- Use one template to program multiple radios simply change unit IDs and download the file to each radio

COMPUTER REQUIREMENTS

- 800 MHz Pentium or greater
- 128 MB RAM
- 40 MB hard disk space
- CD-ROM drive

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EFJohnson TECHNOLOGIES

EFJohnson TECHNOLOGIES | Mobile Radios

EFJohnson's Viking™ Solution portfolio offers products catering to mission critical communication systems. Viking P25 subscribers offer a broad set of capabilities to fully meet the communication needs of our customer networks with interoperability, reliability, and maximum flexibility.

5300 ES

7/800 MHz | VHF | UHF

Award-winning P25 mobile radio featuring AES encryption, interoperability, and the AMBE+2 vocoder for loud and clear digital audio.

ROBUST & FLEXIBLE

- All supported protocols available simultaneously
- AES, DES, and DES-OFB encryption with 64 keys
- Compatible with Motorola® System v 7.x and Motorola Astro®
- SMARTNET® II/SmartZone® interoperability
- Conventional vote scan is standard
- Supports MDC-1200 and GE-Star signaling
- Up to 864 talkgroups
- Over-the-Air programming (OTAP) option enables you to program radios in the field
- Easy radio programming & feature updating with EFJohnson's PC Configure™ software
- Simplified cabling with single multi-function accessory connection in the rear

DATA & CONTROL INTERFACES

- Supports P25 conventional IP packet data
- Supports GPS AVL data

MULTIPLE CONFIGURATION OPTIONS

- Dash mount
- Remote mount
- Dash mount with remote control head
- Dual remote control heads
- Handheld controller
- Internal or external speaker
- Fixed control stations
- Complete line of accessories including microphones, speakers, and encryption keyloading devices

OPTIONAL LIGHTNING™ CONTROL HEAD

- Electroluminescent display
- Four display modes
- Viewing angle > 160°

AMBE+2 ENHANCED DIGITAL VOCODER

P25 DIGITAL WIRELESS • SANS FIL NUMÉRIQUE • INALÁMBRICO DIGITAL

MADE IN U.S.A.

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TYPICAL PERFORMANCE SPECIFICATIONS

5300 ES 7/800 MHz | UHF | VHF

GENERAL	700/800, 30/35 W	UHF R1, 40 W	VHF
Frequency Range (band splits)	762-806 MHz 806-870 MHz	380-470 MHz	136-174 MHz
Channel Spacing	Analog: 25 kHz, 12.5 kHz P25 Digital: 12.5 kHz		
Max Frequency Separation	Full Band Split		
Display	Backlit LCD, 10 alpha-numeric characters plus Zone, Channel, and Status. Electronically adjustable viewing angle.		
Power Supply			
Nominal Voltage (negative ground)	13.6 VDC	13.6 VDC	13.6 VDC
Operating Supply Voltage Range	10.9 - 16.3 VDC	10.9 - 16.3 VDC	10.9 - 16.3 VDC
Standby Current (back-light off)	700 mA	400 mA	400 mA
Standby Current (Lighting™ Control Head)	900 mA	700 mA	700 mA
Receive Current at Rated Audio Power	2.65 A	2.65 A	2.65A
Receive Current at Rated Audio Power (Lightning)	2.85 A	2.85 A	2.85 A
Current at Max Rated Transmit Power	12.5 A	10 A	12.5 A
Temperature Range	Operating: -30°C to +60°C Storage: -40°C to +85°C		
Nominal Dimensions (H x W x D) exclusive of mounting, cables, and knobs	2.1" x 7.2" x 8.3" (5.3 cm x 18.2 cm x 21.1cm)		
Nominal Weight	6.5 lbs (2.3 kg)		
FCC ID	ATH2425372	ATH2425333	ATH2425313
Industry Canada	IC: 933B-2425372	IC: 933B-2425333	IC: 933B-2425313
Vocoder	Enhanced Full-Rate Digital Vocoder (AMBE+2) Project 25		

Transmitter	700/800, 30/35 W	UHF R1, 40 W	VHF
RF Output Power (variable)	15-30 W (762-806 MHz) 15-35 W (806-870 MHz)	10 W - 40 W	15 W - 50 W
Transmitter Frequency Range(s)	762-776, 792-806, 806-825, 851-870 MHz	380 MHz - 470 MHz	136 MHz - 174 MHz
Maximum Frequency Separation	Full Band Split		
Frequency Accuracy (-30°C to +80°C, +25°C ref.)	±1.5 ppm		
Modulation Limiting	25 kHz Channels: ±5 kHz 12.5 kHz Channels: ±2.5 kHz		
Modulation Fidelity (C4FM, 12.5 kHz Digital)	<5%		
Spurious Emissions	-75 dBc		
Audio			
Analog Freq. Response (TIA 6 dB/octive pre-emphasis)	+1 dB, -3 dB	+1 dB, -3 dB	+1 dB, -3 dB
FM Hum and Noise Ratio (25 kHz Analog)	40 dB	45 dB	45 dB
FM Hum and Noise Ratio (12.5 kHz Analog)	34 dB	39 dB	39 dB
Distortion	2%	2%	2%
FCC Emission Designators	8K10FID, 8K10F1E, 11K0F3E, 16K0F3E		

Receiver	700/800, 30/35 W	UHF R1, 40 W	VHF
Receiver Frequency Ranges	762-776, 851-870 MHz	380 MHz - 470 MHz	136 MHz - 174 MHz
Maximum Frequency Separation	Full Band Split		
Sensitivity			
Analog Mode: 12 dB SINAD (25 & 12.5 kHz)	.25µV (-119 dBm)		
Digital Mode: (5% BER)	.25µV (-119 dBm)		
Selectivity (Adjacent Channel Rejection)			
25 kHz Channels, Analog	>80 dB	>75 dB	>75 dB
12.5 kHz Channels	>63 dB	>63 dB	>63 dB
Offset, Digital	<9 dB/kHz	<9 dB/kHz	<9 dB/kHz
Intermodulation	-80 dB	-75 dB	-75 dB
Spurious Response Rejection	-83 dB	-75 dB	-75 dB
Audio			
Analog Freq. Response (TIA 6dB/octave pre-emphasis)	+1 dB, -3 dB		
Output Power (3Ω load) 12W rms	12 W rms		
Distortion (1kHz, 60% Deviation)	<3%		

Environmental Specifications

Environment	Mil Spec	810F
	M	P
Low Pressure	500.5	II
High Temp.	501.5	I, II
Low Temp.	502.5	I, II
Temp. Shock	503.5	I (D)
Solar Radiation	505.5	I (A1)
Rain/Blown Rain	506.5	I, III
Humidity	507.5	NA
Salt Fog	509.5	NA
Dust and Sand	510.5	I, II
Vibration	514.6	I (4), II
Shock	516.6	I, II, V, VI

M=Method, P=Procedure
Also meets equivalent superseded C, D and E standards.

Encryption Options

Supported Encryption	AES, DES, DES-OFB
Encryption Key/ Radio	64 Common Key Reference (CKR), 64 Physical Identifier, (PID), Compatible w/ Motorola Key Variable Loader
Encryption Frame Re-sync Interval	P25 CAI 360 MSEC
Encryption Keying	External Key Loader, OTAR
Synchronization	CFB-Cipher Feedback OFB-Output Feedback
Vector Generator	National Institute of Standards and Technology (NIST) Approved random number generator
Encryption Type	Digital
Key Erasure	Keyboard Command
Code Key Initialization	Internal Pseudorandom Generator
Standards	FIPS 46-3, FIPS 81, FIPS 140-2, FIPS 197

Accessories

- Antennas
- Keypad microphones
- Desk microphones
- Hand-held controller
- Remote control heads
- External speakers
- Power supplies
- Control station components
- Tone remotes
- Encryption key management tools
- Radio programming tools
- Mounting hardware
- Siren control kit

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EFJohnson TECHNOLOGIES

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Lightning™ Control Head

The Lightning™ Control Head has the brightest and clearest display on the market today, and is the perfect complement to our award-winning ES series mobile radio.

LARGE ELECTROLUMINESCENT DISPLAY

- Display resolution: 320 x 80 pixels
- Halo transmit/receive indicator changes color when in transmit or receive mode
- Viewing angle >160°
- Long operating life resists fading
- 200G shock durability
- Emissive pixel technology makes small text more legible

FOUR DISPLAY MODES

Mode	Icon Lines	Alphanumeric Lines	Display Text Characters	Zone/ Channel Indicator	Softkey Lines
1	1	1	10	YES	1
2	1	1	16	NO	1
3	1	2	10	YES	1
4	1	2	16	NO	1

VERSATILITY

- For use with ES Series (5300 ES, 53SL ES,and Ascend™ ES) mobile radios
- Extended temperature range
- 3-Level brightness control
- Navigation key
- Dedicated and protected emergency button

TRANSMIT/RECEIVE INDICATOR LIGHT

No Activity | Receive | Transmit

AMBE+2 ENHANCED DIGITAL VOCODER

P25 DIGITAL WIRELESS

MADE IN U.S.A.

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1440 Corporate Drive, Irving, TX 75038-2401 • www.efjohnson.com
Phone: 972.819.0700 • Toll Free: 1.800.328.3911 • Fax: 972.819.2307

EFJohnson TECHNOLOGIES

EFJohnson's Viking™ Solution portfolio offers products catering to mission critical communication systems. Viking P25 subscribers offer a broad set of capabilities to fully meet the communication needs of our customer networks with interoperability, reliability, and maximum flexibility.

53SL ES

7/800 MHz | VHF | UHF

Interoperable P25 public safety mobile radio featuring the AMBE+2 vocoder, which provides loud and clear digital audio.

ROBUST & FLEXIBLE

- All supported protocols available simultaneously
- DES and DES-OFB encryption with 64 keys
- Compatible with Motorola® System v 7.x and Motorola Astro®
- SMARTNET® II/SmartZone® interoperability
- Conventional vote scan is standard
- Supports MDC-1200 and GE-Star signaling
- Up to 512 talkgroups
- Over-the-Air programming (OTAP) option enables you to program radios in the field
- Easy radio programming & feature updating with EFJohnson's PC Configure™ software
- Simplified cabling with single multi-function accessory connection in the rear

DATA & CONTROL INTERFACES

- Supports P25 conventional IP packet data
- Supports GPS AVL data

MULTIPLE CONFIGURATION OPTIONS

- Dash mount
- Remote mount
- Dash mount with remote control head
- Dual remote control heads
- Handheld controller
- Internal or external speaker
- Fixed control stations
- Complete line of accessories including microphones, speakers, and encryption keyloading devices

OPTIONAL LIGHTNING™ CONTROL HEAD

- Electroluminescent display
- Four display modes
- Viewing angle > 160°

AMBE+2 ENHANCED DIGITAL VOCODER

P25 DIGITAL WIRELESS • SANS FULL NUMERIQUE • UNALAMBRICO

MADE IN U.S.A.

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TYPICAL PERFORMANCE SPECIFICATIONS

53SL ES 7/800 MHz | UHF | VHF

GENERAL	700/800, 30/35 W	UHF R1, 40 W	VHF
Frequency Range (band splits)	762-806 MHz 806-870 MHz	380-470 MHz	136-174 MHz
Channel Spacing	Analog: 25 kHz, 12.5 kHz P25 Digital: 12.5 kHz		
Max Frequency Separation	Full Band Split		
Display	Backlit LCD, 10 alpha-numeric characters plus Zone, Channel, and Status. Electronically adjustable viewing angle.		
Power Supply			
Nominal Voltage (negative ground)	13.6 VDC	13.6 VDC	13.6 VDC
Operating Supply Voltage Range	10.9 - 16.3 VDC	10.9 - 16.3 VDC	10.9 - 16.3 VDC
Standby Current (back-light off)	700 mA	400 mA	400 mA
Standby Current (Lighting™ Control Head)	900 mA	700 mA	700 mA
Receive Current at Rated Audio Power	2.65 A	2.65 A	2.65A
Receive Current at Rated Audio Power (Lightning)	2.85 A	2.85 A	2.85 A
Current at Max Rated Transmit Power	12.5 A	10 A	12.5 A
Temperature Range	Operating: -30°C to +60°C Storage: -40°C to +85°C		
Nominal Dimensions (H x W x D) exclusive of mounting, cables, and knobs	2.1" x 7.2" x 8.3" (5.3 cm x 18.2 cm x 21.1cm)		
Nominal Weight	6.5 lbs (2.3 kg)		
FCC ID	ATH2425372	ATH2425333	ATH2425313
Industry Canada	IC: 933B-2425372	IC: 933B-2425333	IC: 933B-2425313
Vocoder	AMBE+2		

Transmitter	700/800, 30/35 W	UHF R1, 40 W	VHF
RF Output Power (variable)	15-30 W (762-806 MHz)	10 W - 40 W 15-35 W (806-870 MHz)	15 W - 50 W
Transmitter Frequency Range(s)	762-776, 792-806, 806-825, 851-870 MHz	380 MHz - 470 MHz	136 MHz - 174 MHz
Maximum Frequency Separation	Full Band Split		
Frequency Accuracy (-30°C to +80°C, +25°C ref.)	±1.5 ppm		
Modulation Limiting	25 kHz Channels: ±5 kHz 12.5 kHz Channels: ±2.5 kHz		
Modulation Fidelity (C4FM, 12.5 kHz Digital)	<5%		
Spurious Emissions	-75 dBc		
Audio			
Analog Freq. Response (TIA 6 dB/octive pre-emphasis)	+1 dB, -3 dB	+1 dB, -3 dB	+1 dB, -3 dB
FM Hum and Noise Ratio (25 kHz Analog)	40 dB	45 dB	45 dB
FM Hum and Noise Ratio (12.5 kHz Analog)	34 dB	39 dB	39 dB
Distortion	2%	2%	2%
FCC Emission Designators	8K10FID, 8K10F1E, 11K0F3E, 16K0F3E		

Receiver	700/800, 30/35 W	UHF R1, 40 W	VHF
Receiver Frequency Ranges	762-776, 851-870 MHz	380 MHz - 470 MHz	136 MHz - 174 MHz
Maximum Frequency Separation	Full Band Split		
Sensitivity			
Analog Mode: 12 dB SINAD (25 & 12.5 kHz)	.25µV (-119 dBm)		
Digital Mode: (5% BER)	.25µV (-119 dBm)		
Selectivity (Adjacent Channel Rejection)			
25 kHz Channels, Analog	>80 dB	>75 dB	>75 dB
12.5 kHz Channels	>63 dB	>63 dB	>63 dB
Offset, Digital	<9 dB/kHz	<9 dB/kHz	<9 dB/kHz
Intermodulation	-80 dB	-75 dB	-75 dB
Spurious Response Rejection	-83 dB	-75 dB	-75 dB
Audio			
Analog Freq. Response (TIA 6dB/octave pre-emphasis)	+1 dB, -3 dB		
Output Power (3Ω load) 12W rms	12 W rms		
Distortion (1kHz, 60% Deviation)	<3%		

Environmental Specifications

Environment	Mil Spec	810F
	M	P
Low Pressure	500.5	II
High Temp.	501.5	I, II
Low Temp.	502.5	I, II
Temp. Shock	503.5	I (D)
Solar Radiation	505.5	I (A1)
Rain/Blown Rain	506.5	I, III
Humidity	507.5	NA
Salt Fog	509.5	NA
Dust and Sand	510.5	I, II
Vibration	514.6	I (4), II
Shock	516.6	I, II, V, VI

M=Method, P=Procedure
Also meets equivalent superseded C, D and E standards.

Encryption Options

Supported Encryption	AES, DES, DES-OFB
Encryption Key/ Radio	64 Common Key Reference (CKR), 64 Physical Identifier, (PID), Compatible w/ Motorola Key Variable Loader
Encryption Frame Re-sync Interval	P25 CAI 360 MSEC
Encryption Keying	External Key Loader, OTAR
Synchronization	CFB-Cipher Feedback OFB-Output Feedback
Vector Generator	National Institute of Standards and Technology (NIST) Approved random number generator
Encryption Type	Digital
Key Erasure	Keyboard Command
Code Key Initialization	Internal Pseudorandom Generator
Standards	FIPS 46-3, FIPS 81, FIPS 140-2, FIPS 197

Accessories

- Antennas
- Keypad microphones
- Desk microphones
- Hand-held controller
- Remote control heads
- External speakers
- Power supplies
- Control station components
- Tone remotes
- Encryption key management tools
- Radio programming tools
- Mounting hardware
- Siren control kit

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EFJohnson TECHNOLOGIES

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Deployment Case

5300 ES Series Mobile

Compact, lightweight and versatile P25 mobile radio featuring AES encryption, interoperability, and the AMBE+2 vocoder for loud and clear digital audio.

The award-winning 5300 ES Series Mobile Radios from EFJohnson Technologies meets the needs of first responders with a powerful mobile radio that protects your investment for years to come. Seamless interoperability with analog and digital, wideband and narrowband, best-in-class digital audio with the Enhanced (AMBE+2) Project 25 Vocoder, and a wide variety of trunking protocols – all available simultaneously in the same radio – makes the 5300 ES ideal for migrating critical systems to the latest open standards. This flexibility helps protect your investment in the future as well as maximizes interoperability among most installed systems. If you need a multi-protocol mobile radio that leads the industry in feature richness and system interoperability, then the 5300 ES Series Mobile Radio is the right choice.

KEY FEATURES & BENEFITS

- Multiple power options (24V HMMWV, 12V, 110V)
- Multiple case colors (black, green, yellow, orange)
- Closed case operation with included external handheld control head microphone
- UHF, VHF or 700/800 MHz bands

ROBUST & FLEXIBLE

- All supported protocols available simultaneously
- AES, DES, and DES-OFB encryption with 64 keys
- Compatible with Motorola® System v 7.x and Motorola Astro®
- SMARTNET® II/SmartZone® interoperability
- Conventional vote scan is standard
- Supports MDC-1200 and GE-Star signaling
- Up to 864 talkgroups
- Over-the-Air programming (OTAP) option enables you to program radios in the field
- Easy radio programming & feature updating with EFJohnson's PC Configure™ software
- Simplified cabling with single multi-function accessory connection in the rear

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EFJohnson TECHNOLOGIES

TYPICAL PERFORMANCE SPECIFICATIONS

5300 ES 7/800 MHz | UHF | VHF

GENERAL	700/800, 30/35 W	UHF R1, 40 W	VHF
Frequency Range (band splits)	762-806 MHz 806-870 MHz	380-470 MHz	136-174 MHz
Channel Spacing	Analog: 25 kHz, 12.5 kHz P25 Digital: 12.5 kHz		
Max Frequency Separation	Full Band Split		
Display	Backlit LCD, 10 alpha-numeric characters plus Zone, Channel, and Status. Electronically adjustable viewing angle.		
Power Supply			
Nominal Voltage (negative ground)	13.6 VDC	13.6 VDC	13.6 VDC
Operating Supply Voltage Range	10.9 - 16.3 VDC	10.9 - 16.3 VDC	10.9 - 16.3 VDC
Standby Current (back-light off)	700 mA	400 mA	400 mA
Standby Current (Lighting™ Control Head)	900 mA	700 mA	700 mA
Receive Current at Rated Audio Power	2.65 A	2.65 A	2.65A
Receive Current at Rated Audio Power (Lightning)	2.85 A	2.85 A	2.85 A
Current at Max Rated Transmit Power	12.5 A	10 A	12.5 A
Temperature Range	Operating: -30°C to +60°C Storage: -40°C to +85°C		
Nominal Dimensions (H x W x D) exclusive of mounting, cables, and knobs	2.1" x 7.2" x 8.3" (5.3 cm x 18.2 cm x 21.1cm)		
Nominal Weight	6.5 lbs (2.3 kg)		
FCC ID	ATH2425372	ATH2425333	ATH2425313
Industry Canada	IC: 933B-2425372	IC: 933B-2425333	IC: 933B-2425313
Vocoder	Enhanced Full-Rate Digital Vocoder (AMBE+2) Project 25		

Transmitter	700/800, 30/35 W	UHF R1, 40 W	VHF
RF Output Power (variable)	15-30 W (762-806 MHz) 15-35 W (806-870 MHz)	10 W - 40 W	15 W - 50 W
Transmitter Frequency Range(s)	762-776, 792-806, 806-825, 851-870 MHz	380 MHz - 470 MHz	136 MHz - 174 MHz
Maximum Frequency Separation	Full Band Split		
Frequency Accuracy (-30°C to +80°C, +25°C ref.)	±1.5 ppm		
Modulation Limiting	25 kHz Channels: ±5 kHz 12.5 kHz Channels: ±2.5 kHz		
Modulation Fidelity (C4FM, 12.5 kHz Digital)	<5%		
Spurious Emissions	-75 dBc		
Audio			
Analog Freq. Response (TIA 6 dB/octive pre-emphasis)	+1 dB, -3 dB	+1 dB, -3 dB	+1 dB, -3 dB
FM Hum and Noise Ratio (25 kHz Analog)	40 dB	45 dB	45 dB
FM Hum and Noise Ratio (12.5 kHz Analog)	34 dB	39 dB	39 dB
Distortion	2%	2%	2%
FCC Emission Designators	8K10FID, 8K10F1E, 11K0F3E, 16K0F3E		

Receiver	700/800, 30/35 W	UHF R1, 40 W	VHF
Receiver Frequency Ranges	762-776, 851-870 MHz	380 MHz - 470 MHz	136 MHz - 174 MHz
Maximum Frequency Separation	Full Band Split		
Sensitivity			
Analog Mode: 12 dB SINAD (25 & 12.5 kHz)	.25µV (-119 dBm)		
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Analog Freq. Response (TIA 6dB/octave pre-emphasis)	+1 dB, -3 dB		
Output Power (3Ω load) 12W rms	12 W rms		
Distortion (1kHz, 60% Deviation)	<3%		

Environmental Specifications

Environment	Mil Spec	810F
	M	P
Low Pressure	500.5	II
High Temp.	501.5	I, II
Low Temp.	502.5	I, II
Temp. Shock	503.5	I (D)
Solar Radiation	505.5	I (A1)
Rain/Blown Rain	506.5	I, III
Humidity	507.5	NA
Salt Fog	509.5	NA
Dust and Sand	510.5	I, II
Vibration	514.6	I (4), II
Shock	516.6	I, II, V, VI

M=Method, P=Procedure
Also meets equivalent superseded C, D and E standards.

Encryption Options

Supported Encryption	AES, DES, DES-OFB
Encryption Key/ Radio	64 Common Key Reference (CKR), 64 Physical Identifier, (PID), Compatible w/ Motorola Key Variable Loader
Encryption Frame Re-sync Interval	P25 CAI 360 MSEC
Encryption Keying	External Key Loader, OTAR
Synchronization	CFB-Cipher Feedback OFB-Output Feedback
Vector Generator	National Institute of Standards and Technology (NIST) Approved random number generator
Encryption Type	Digital
Key Erasure	Keyboard Command
Code Key Initialization	Internal Pseudorandom Generator
Standards	FIPS 46-3, FIPS 81, FIPS 140-2, FIPS 197

Accessories

- Antennas
- Keypad microphones
- Desk microphones
- Hand-held controller
- Remote control heads
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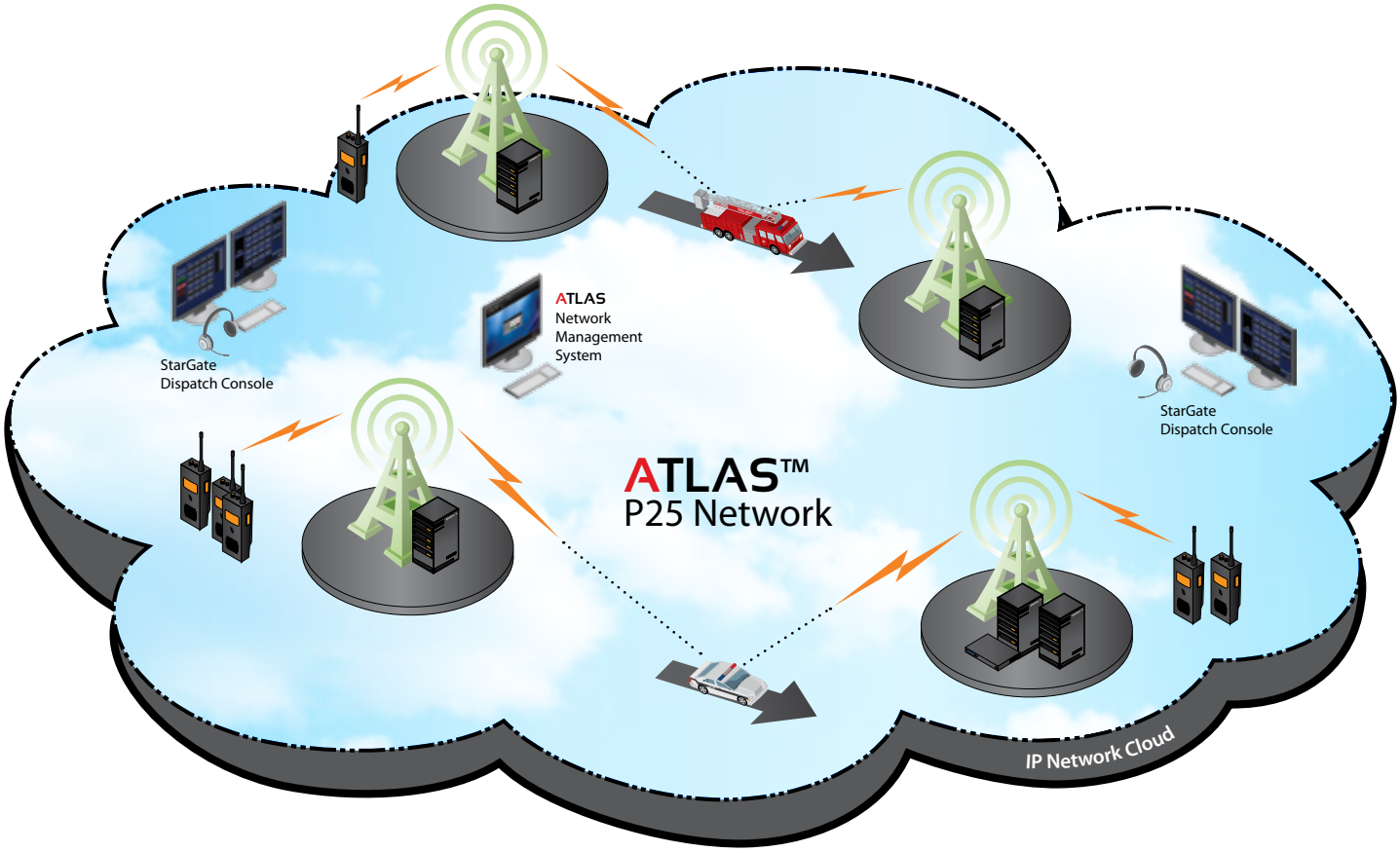
EFJohnson TECHNOLOGIES

EFJohnson TECHNOLOGIES | P25 Systems Products

ATLAS™ | System Solutions Overview

Land Mobile Radio (LMR) networks are an integral part of mission critical communications infrastructure. The EFJohnson ATLAS™ P25 solution offers public safety organizations and decision makers with the ultimate in solution flexibility, interoperability, and scalability in a unique and cost-effective manner. The ATLAS P25 system solution is comprehensive in scope with options for deploying various architectures including conventional, trunked, hybrid, and simulcast multi-site networks.

EFJohnson is committed to provide reliable turnkey solutions to our public safety customers. Our focus is on delivering end-to-end system capability and solution ownership including program management, design and installation services, maintenance and monitoring, training, and ongoing support.



EFJohnson's ATLAS P25 infrastructure solution utilizes a unique, flexible, distributed, and scalable IP based architecture designed to meet mission critical needs. ATLAS system solutions are flexible and designed to fit the specific needs of each customer whether it is a greenfield system deployment, migration from proprietary technologies, or evolution from analog to a digital P25 system.

ATLAS™ | System Solutions Overview

Wide Area Architecture

The ATLAS P25 solution is designed to offer seamless wide area connectivity to the public safety end user in a single or multi-site environment regardless of system type (conventional, trunked, or hybrid). This unique capability allows first responders and public safety users to communicate across site boundaries over the common IP network backbone and help alleviate manual interventions such as channel/talkgroup changes.

Fully Distributed Switchless Network

Fully distributed architecture enables maximum flexibility and scalability in network design and deployment. By eliminating expensive centralized core network and site equipment, the ATLAS P25 solution increases network reliability and eliminates single point of failure across the mission critical network architecture.

Decentralized Call Control and Switching Mobility

A key benefit of the ATLAS P25 distributed network architecture is the ability to distribute call control and switching functions across the wide area network. This enables the ATLAS system to track first responders and users across a wide area network and offer features like individual and group calls from a trunked network to a conventional system without the need for a dispatcher to patch calls across systems. In addition, users can experience seamless mobility and roaming capability across the network without relying on centralized switching.

Self-Discovery and Auto-Healing

The ATLAS P25 network solution distributes the call processing and subscriber database management across the multi-site network, thereby allowing independent site-to-site connectivity and call control. This enables the entire network to overcome network outages by being able to self-heal and operate as independent distributed networks when a particular part of the network experiences the outage. In addition, the distributed network also performs self-discovery when new sites are added to the network topology and can be invaluable to grow the network without any disruptions to the existing topology.

Multi-Protocol Interoperability, Migration, and Scalability

The ATLAS P25 solution includes several interoperability gateways and interfaces that allow legacy and proprietary networks to be seamlessly integrated through the dispatch console. In addition, the lack of a centralized control point in the architecture allows easy addition of new sites and equipment resulting in quicker deployments and less equipment to monitor. This leads to increased reliability and lower maintenance costs.

Shared Unified Network Management and Dispatch

The state-of-the-art web based network management system offers a unified solution to manage and configure all aspects of the ATLAS solution including conventional, trunked, hybrid, and simulcast systems. In addition, the StarGate™ Dispatch Console is a next generation console that provides interoperability via direct connection to P25 trunked and conventional systems, analog systems, paging systems, and a variety of other disparate systems via control stations.

Native IP Solution

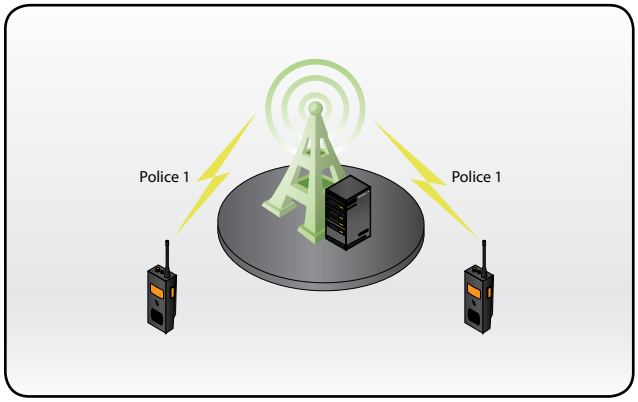
Derived from standards-based IP technology, the ATLAS P25 solution offers a best-in-class solution, avoiding proprietary and expensive network components, while enhancing maintainability and interoperability across the P25 network.

ATLAS™ | Architecture Options

System Architecture Feature Highlights	Conventional	Trunked	Hybrid	Simulcast
Cost Effective and Simple System Expansion	✔	✔	✔	✔
"Plug and Play" Scalability	✔	✔	✔	✔
P25 Mode	✔	✔	✔	✔
Analog Mode	✔	✔	✔	✔
Patch Free Call Routing Between Conventional and Trunked	--	--	✔	--

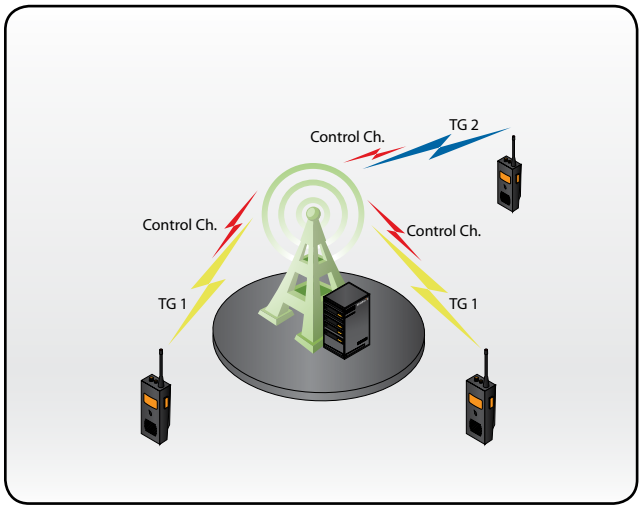
Conventional Systems

ATLAS conventional system solutions have a dedicated repeater channel for system user groups. Typically they are deployed in regions covering large geographic areas and/or have moderate quantities of users. Often these system user groups are organized based upon responsibility such as Fire, Police, EMS, Public Works, and Mutual Aid, and in many cases each of these groups have a corresponding dedicated repeater channel. The ATLAS conventional system provides mixed mode analog/P25 operation which allows a graceful, cost- effective radio migration strategy. Conversion to a P25 trunked system is made simple primarily via a software upgrade to the repeater channels.



Trunked Systems

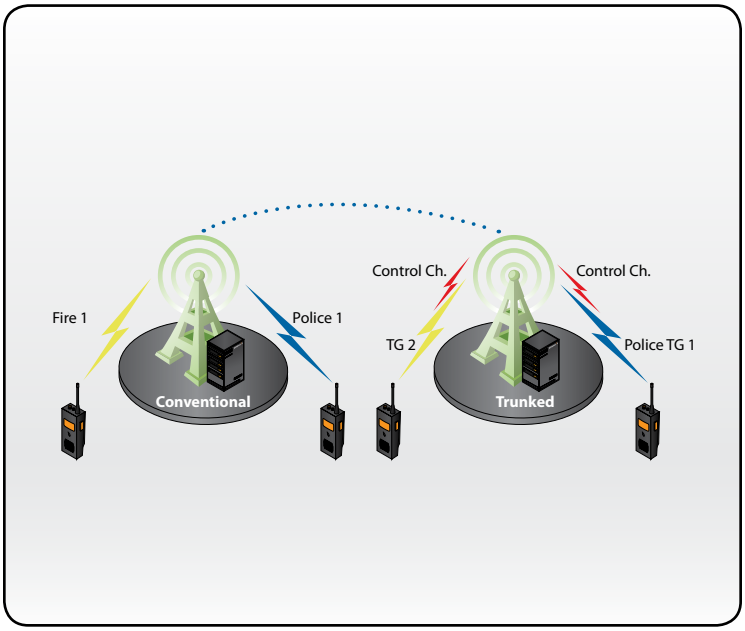
ATLAS trunked system solutions have a shared pool of repeater channels for use among system user talkgroups. Typically, they are deployed in regions covering moderate geographic areas and/or have large quantities of users. Often these system talkgroups are organized on a functional basis such as Fire, Police, EMS, Public Works, and Mutual Aid. In trunked systems, the repeater channels at each site are divided into a "control channel" and multiple "voice channels." The "control channel" registers the radio into the system and dynamically coordinates radio talkgroup PTT (push-to talk) with any available "voice channel." The shared pool of repeater channels facilitates more talkgroups and significantly more users than a dedicated repeater channel in a conventional system. The ATLAS trunked system is based upon industry-standard P25 operation which promotes interoperability and maximizes grant funding opportunities.



ATLAS™ | Architecture Options

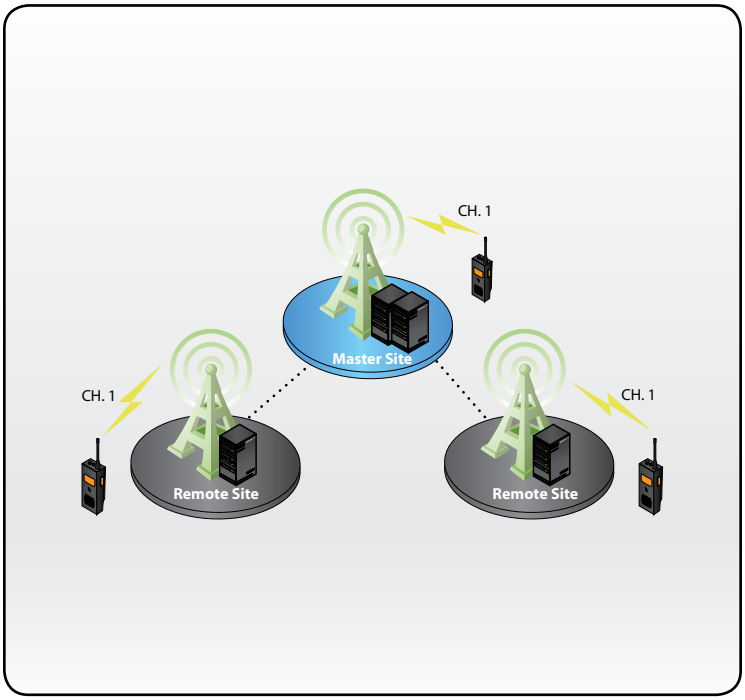
Hybrid Systems

ATLAS hybrid system solutions are an industry first, unique implementation that combines conventional and trunked repeater channels into a single system. Typically, they are deployed in applications where both large and small quantities of users are found in separate geographic areas. With this system, users can be organized functionally such as Fire, Police, EMS, and Public Works, for either the conventional or trunked part of the system depending on need. The ATLAS hybrid system provides significant cost savings by applying trunked sites only where needed. With a simple method for converting repeater channels from conventional to trunked, initial investment is maximized and capacity can be expanded as required. Additionally, call routing between conventional and trunked system repeater channels is patch free, meaning that dispatch console assistance is not required to connect these disparate system types.



Simulcast Systems

ATLAS simulcast system solutions are configured for conventional or trunked operation. Typically they are deployed in regions covering moderate geographic areas, have limited frequencies available, and often require improved in-building radio coverage. Similar to other architecture options, these systems are organized on a functional basis such as Fire, Police, EMS, and Public Works. Simulcast systems have a single master site and multiple remote sites. The master site "synchronizes" the system timing so that calls are transmitted simultaneously at all sites for a given repeater channel, which reduces the quantity of frequencies needed for the system and simplifies frequency coordination. The ATLAS simulcast system supports analog conventional, P25 conventional, and P25 trunked operation. Auto discovery, tuning, and network delay compensation result in quicker system turn-up and reduced maintenance activities. Conversion from a P25 conventional simulcast system to a P25 trunked simulcast system is made simple primarily via a software upgrade to the repeater channels.



ATLAS™ | A Smarter Way to P25

The ATLAS solution uses an IP-based, fully distributed architecture allowing it to easily scale from a single site to a state-wide network. In addition, the fully distributed architecture eliminates the need for a central controller, which significantly increases system reliability, decreases cost, and ensures our customers are able to successfully execute their mission-critical tasks.

The Benefits of Distributed Architecture

1. **Expandability (multi-site, multiple system types, multi-channel)**

   - Ability to start small then add more equipment to expand as needed
   - When upgrading, purchases can be spread out to match budget cycle (rather than having to purchase expensive central controllers up-front)
   - System is cost-effective initially and remains cost-effective as the system grows; there is no big switch to buy up-front
   - Dynamic discovery allows easier addition of new system equipment without affecting the operation of current equipment
   - Utilizing system gateways enables reuse of existing equipment and interoperability with the current system, allowing easier migration
   - Future-proof the investment - expand the system without completely replacing it
   - Flexible expansion – add trunking sites to a conventional system without changing rest of the system

2. **Scalability (network & site capacity)**

   - Distributed control allows customers to increase capacity by adding sites, not expanding the central switch
   - With distributed traffic management there is no additional bandwidth requirement for existing sites as new sites are added, ensuring minimal impact as system capacity grows

3. **Reliability and Resilience**

   - Use of a distributed architecture provides multiple levels of redundancy as each site is capable of performing wide area system functions
   - The ATLAS P25 solution goes beyond eliminating single points of failure by providing a fully distributed and fully redundant system at no additional cost
   - In the event of a natural disaster, the ATLAS solution can continue to provide full wide area functionality between connected system components when parts of the network are down due to lack of network connectivity
   - Uses patented auto discovery mechanisms to self-heal as network connections are reestablished without manual intervention

EFJohnson's patented distributed system architecture provides unparalleled expandability, scalability, reliability, and resilience that is difficult to duplicate using a traditional centralized architecture. The ATLAS P25 System Solution is designed to provide customers the most flexibility and lowest cost of ownership in the industry.

The ATLAS P25 Systems Solution was selected as an Association of Public Safety Communications Officials (APCO) "Hot Product."

ATLAS™ 4100 Multimode Station

Compact scalable multimode IP based station that enables flexible deployment options in a robust and reliable next generation platform.

The ATLAS 4100 Multimode Station offers market-leading analog and P25 mixed-mode capabilities in a robust, reliable, and compact form factor. Designed and built to exceed industry standards and specifications, it is available in a range of frequency bands including VHF, UHF, 700, and 800 MHz.

FLEXIBLE ARCHITECTURE

- Leverages a common hardware platform to support multiple operating modes including analog/P25 conventional and P25 trunked operation
- Modular architecture allows flexible expansion of sites and seamless scalability of the system
- Compact 2RU form factor maximizes rack space usage

EASE OF USE AND MAINTAINABILITY

- Intuitive configuration programming interface to enable quick and trouble-free installation
- Interactive front panel design displays status and diagnostics for rapid troubleshooting
- Flexible upgrades of software

ADVANCED NEXT GENERATION DESIGN AND PERFORMANCE

- Built for continuous duty cycle operation with ruggedized modules, boards, and components
- High efficiency power amplifier heatsink design maximizes heat dissipation and equipment longevity
- Low current consumption in transmit and receive modes

ATLAS™ 4100 Multimode Station

TECHNICAL DATA

GENERAL	VHF	UHF	700 MHz	800 MHz
Mounting	19" rack or shelf			
Dimensions (HxWxD)	3.5" x 19" x 14"			
Weight	20 lbs.			
Temperature Range	-30°C to +60°C			
Input Voltage	13.8VDC ±10%			
Power Consumption	100 W Tx - 220 W | 15 W Rx		100 W Tx - 300 W | 15 W Rx	
Frequency Resolution	12.5 kHz			
FCC Compliance	Parts 15 and 90			

TRANSMITTER	Analog	Digital	Analog	Digital	Digital	Analog	Digital
Frequency Range	135-160, 148-174 MHz		370-400, 400-435, 435-470, 455-490 MHz		769-775 MHz	851-869 MHz	
RF Output Power	25 W - 100 W						
Duty Cycle	100%						
Output Impedance	50 Ohms						
Spurious Emissions	100 dB						
Harmonic Emissions	100 dB						
Maximum Deviation	± 2.5 kHz	± 3110 kHz	± 2.5 kHz	± 3110 kHz	± 3110 kHz	± 5 kHz	± 3110 kHz
Audio Response	As per TIA						
Audio Distortion	2%	N/A	2%	N/A	N/A	2%	N/A
Emission Designators	11K0F3E	8K10F1E, 8K10F1D	11K0F3E	8K10F1E, 8K10F1D	8K10F1E, 8K10F1D	16K0F3E, 14K0F3E	8K10F1E, 8K10F1D
Hum & Noise (TIA)	45 dB	N/A	45 dB	N/A	N/A	50 dB	N/A
Frequency Stability (-30°C to +60°C)	± 1.0 PPM						

RECEIVER	Analog	Digital	Analog	Digital	Digital	Analog	Digital
Channel Spacing	12.5 kHz					25, 12.5 kHz	12.5 kHz
Frequency Range	135-160, 148-174 MHz		370-400, 400-435, 435-470, 455-490 MHz		799-805 MHz	806-824 MHz	
Sensitivity: 12dB SINAD	-117 dBm	N/A	-117 dBm	N/A	N/A	-117 dBm	N/A
Sensitivity: for 5% BER	N/A	-117 dBm	N/A	-117 dBm	-117 dBm	N/A	-117 dBm
Selectivity	72 dB	60 dB	72 dB	60 dB	60 dB	78 dB	60 dB
Signal Displacement Bandwith	± 1 kHz						
Frequency Stability (-30°C to +60°C)	± 1.0 PPM		± 1.0 PPM		± 0.1 PPM	± 1.0 PPM	
Intermodulation Rejection	82 dB						
Spurious & Image Rejection	90 dB						
Audio Response (1000 Hz ref.)	As per TIA						
Audio Distortion (at 1000 Hz)	2%	As per TIA	2%	As per TIA	As per TIA	2%	As per TIA
Hum & Noise (TIA)	45 dB	As per TIA	45 dB	As per TIA	As per TIA	50 dB	As per TIA
RF Input Impedance	50 Ohms						

STANDARDS COMPLIANCE	
EFJohnson's stations comply with the following standard specifications:	
P25 Digital Operation	TIA 102.CAAB-C
Analog FM Operation	TIA 603-D
EMI/EMC	NTIA Manual Chapter 5
PSTN Line Isolation	FCC Part 68 (USA)

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EFJohnson TECHNOLOGIES

ATLAS™ 4200 Multimode Simulcast Station

Compact scalable IP based simulcast station that simplifies deployment and support while reducing lifetime ownership costs.

The ATLAS 4200 Multimode Simulcast Station offers market-leading simulcast capabilities for analog and P25 mixed-mode in a robust, reliable, and compact form factor. Designed and built to exceed industry standards and specifications, it is available in a range of frequency bands including VHF, UHF, 700, and 800 MHz.

FLEXIBLE ARCHITECTURE

- Support for analog and P25 conventional simulcast and P25 trunked simulcast operation
- Synchronized timing throughout the network is enabled with an integrated time synchronization interface and GPS receiver input
- Integrated simulcast manager provides launch time for all repeaters of a simulcast channel
- P25 and analog voting functionality implemented with an integrated voter comparator
- Compact 2RU form factor maximizes rack space usage

EASE OF USE AND MAINTAINABILITY

- Intuitive configuration programming interface to enable quick and trouble-free installation
- Interactive front panel design displays status and diagnostics for rapid troubleshooting
- Flexible upgrades of software

ADVANCED NEXT GENERATION DESIGN AND PERFORMANCE

- Built for continuous duty cycle operation with ruggedized modules, boards, and components
- High efficiency power amplifier heatsink design maximizes heat dissipation and equipment longevity
- Low current consumption in transmit and receive modes
- Supports external high stability frequency reference to achieve ±0.1 ppm frequency accuracy

ATLAS™ 4200 Multimode Simulcast Station

TECHNICAL DATA

GENERAL	VHF	UHF	700 MHz	800 MHz
Mounting	19" rack or shelf			
Dimensions (HxWxD)	3.5" x 19" x 14"			
Weight	20 lbs.			
Temperature Range	-30°C to +60°C			
Input Voltage	13.8VDC ±10%			
Power Consumption	100 W Tx - 220 W | 15 W Rx		100 W Tx - 300 W | 15 W Rx	
Frequency Resolution	12.5 kHz			
FCC Compliance	Parts 15 and 90			

TRANSMITTER	Analog	Digital	Analog	Digital	Digital	Analog	Digital
Frequency Range	135-160, 148-174 MHz		370-400, 400-435, 435-470, 455-490 MHz		769-775 MHz	851-869 MHz	
RF Output Power	25 W - 100 W						
Duty Cycle	100%						
Output Impedance	50 Ohms						
Spurious Emissions	100 dB						
Harmonic Emissions	100 dB						
Maximum Deviation	± 2.5 kHz	± 3110 kHz	± 2.5 kHz	± 3110 kHz	± 3110 kHz	± 5 kHz	± 3110 kHz
Audio Response	As per TIA						
Audio Distortion	2%	N/A	2%	N/A	N/A	2%	N/A
Emission Designators	11K0F3E	8K10F1E, 8K10F1D	11K0F3E	8K10F1E, 8K10F1D	8K10F1E, 8K10F1D	16K0F3E, 14K0F3E	8K10F1E, 8K10F1D
Hum & Noise (TIA)	45 dB	N/A	45 dB	N/A	N/A	50 dB	N/A
Frequency Stability (-30°C to +60°C)	± 1.0 PPM						

RECEIVER	Analog	Digital	Analog	Digital	Digital	Analog	Digital
Channel Spacing	12.5 kHz					25, 12.5 kHz	12.5 kHz
Frequency Range	135-160, 148-174 MHz		370-400, 400-435, 435-470, 455-490 MHz		799-805 MHz	806-824 MHz	
Sensitivity: 12dB SINAD	-117 dBm	N/A	-117 dBm	N/A	N/A	-117 dBm	N/A
Sensitivity: for 5% BER	N/A	-117 dBm	N/A	-117 dBm	-117 dBm	N/A	-117 dBm
Selectivity	72 dB	60 dB	72 dB	60 dB	60 dB	78 dB	60 dB
Signal Displacement Bandwith	± 1 kHz						
Frequency Stability (-30°C to +60°C)	± 0.1 PPM						
Intermodulation Rejection	82 dB						
Spurious & Image Rejection	90 dB						
Audio Response (1000 Hz ref.)	As per TIA						
Audio Distortion (at 1000 Hz)	2%	As per TIA	2%	As per TIA	As per TIA	2%	As per TIA
Hum & Noise (TIA)	45 dB	As per TIA	45 dB	As per TIA	As per TIA	50 dB	As per TIA
RF Input Impedance	50 Ohms						

STANDARDS COMPLIANCE	
EFJohnson's stations comply with the following standard specifications:	
P25 Digital Operation	TIA 102.CAAB-C
Analog FM Operation	TIA 603-D
EMI/EMC	NTIA Manual Chapter 5
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EFJohnson TECHNOLOGIES

ATLAS™ 6100/6200 Network Management System

Web based management system offering full breadth of OA&M capabilities for in-depth network maintenance and monitoring.

ATLAS NMS is a state-of-the-art web based network management system that provides centralized network management functionality for all EFJohnson infrastructure products. It is available in two options: ATLAS 6100 Basic NMS for small systems and ATLAS 6200 Advanced NMS for large systems.

CONFIGURATION

- Management and deployment of configuration to all infrastructure products including conventional systems, trunking systems, StarGate™ consoles, and gateways
- Remote software upgrade of infrastructure products
- Management and deployment of subscriber and talkgroup records
- Manual and scheduled backup and restore of system data
- Radio administration including radio inhibit, dynamic regrouping, and radio check

SECURITY

- Agency specific management of subscriber records, talkgroup records, and reporting
- Predefined and custom roles that restrict operator access and activity based on access credentials

FAULT & PERFORMANCE MANAGEMENT

- Real time fault monitoring of system components
- Extensive reports covering system usage and user activities
- Real time monitoring of user and channel activities
- Full redundancy capability

ATLAS™ 6100/6200 Network Management System

TECHNICAL DATA

GENERAL	6100 Basic NMS	6200 Advanced NMS
Number of Configurable Subscribers	48000	48000
Number of Configurable Talkgroups	16000	16000
Subscriber ID Range	1-16777215	1-16777215
Talkgroup ID Range	1-65535	1-65535
Number of Configurable Trunking Sites	1 with 10 Channel	255
Number of Configurable Conventional Sites	10	255
Number of Configurable StarGate™ Consoles	4	100
Redundancy	N/A	Option
Multi Agency Partitioning	N/A	Included
Custom Role Management	N/A	Included
Metrics Reporting	N/A	Included
Zoned Access Control	N/A	Included
Critical Site Assignment	Included	Included
LiveView System Monitoring	N/A	Included
Number of Active Channels Monitored	N/A	100
Number of Simultaneous Client Connections	12	12
Number of Operator Accounts	30	30
Supported Firefox Browser Version	8.0 or Higher	8.0 or Higher
Supported Internet Explorer Browser Version	8 or Higher	8 or Higher

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EFJohnson TECHNOLOGIES

StarGate™ 7000 Console

Flexible, interoperable, and intuitive console solution with state-of-the-art audio, offering full-featured dispatch capability for multiple systems.

The StarGate 7000 Dispatch Console is EFJohnson's next generation console. It provides interoperability via direct IP connection to P25 trunked, conventional, analog, and Multi-Net® systems and connection to other disparate systems via control stations.

GENERAL

- IP based, fully distributed with no requirement for central control equipment allowing extensive scalability and expansion and no single point of failure
- Built in end-to-end encryption support (standard DES-OFB and AES)

INTEROPERABILITY

- P25 conventional and trunked operation
- Interoperability with disparate systems via EFJohnson control station allowing group call, channel/zone change, scan, and emergency operations
- Analog signaling with tone support including two-tone paging, DTMF tones, and alert tones
- Built-in telephone interconnect and NENA operation
- Dispatch to Multi-Net system

AUDIO

- AMBE+2 vocoder provides enhanced digital P25 audio
- Best-in-class voice clarity through custom audio management hardware
- Superior audio fidelity through Bose® speakers
- Built-in equalizer to allow operator specific transmit voice quality adjustments
- 10 speaker support

GRAPHICAL USER INTERFACE

- Modular, intuitive, and easy to use GUI with multiple monitor support (including touch screen)
- Distinct shapes and colors with large, easy to read alphanumeric characters
- Fast multi-select and patching operation for responsive incident management
- Emergency window provides visual and audible emergency indication and emergency management
- Detailed history table allows storing and export of up to 1500 activity records

CONFIGURATION

- Fully configurable through ATLAS 6000 or ATLAS 6100 NMS
- Centralized configuration allows creation and reuse of dispatcher profiles
- Centralized management of subscriber and talkgroup ID/alias

StarGate™ 7000 Console

FEATURES

GENERAL	StarGate 7000
Number of configurable talkgroups/radio control modules	96
Number of configurable tabs	8
Number of configurable talkgroups per tab	12
Number of active patches per dispatch position	12
Number of active preset groups per dispatch position	12
Number of entries (call and user activities) in history table	1500
Number of PSTN connections per dispatch position	2
Talkgroup alias character limit	16
Subscriber alias character limit	12
IRR (Instant Recall Recorder) Select/UnSelect	30 Minutes
General Purpose I/O	8 input / 8 output
10 speaker support	Standard
Multi monitor capability	Standard
DES-OFB	Standard
AES	Standard
P25 Conventional and Trunking	Standard
Analog Operation	Standard
Multi-Net Operation	Standard
Control Station	Standard

ACCESSORIES

ITEM	StarGate 7000
Foot Switch	Option (1)
Operator Headset	Option (1)
Supervisor Headset	Option (1)
Desktop Microphone	Standard (1)
Bose® Speakers	Standard (2)
Additional Speakers	Option (8)
LCD Monitor*	Option (3)
Touch Screen Monitor*	Option (1)
PSTN Gateway	Option
General Purpose I/O	Option

**Customized console screen configuration to suit customer application - primary display can be either a regular LCD monitor or touch screen and additional LCD monitors can be added up to a total of three.*

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EFJohnson TECHNOLOGIES

ATLAS™ 8000 Series Interfaces/Gateways

Multi-functional platform providing advanced control, interoperability, and gateway functions for the ATLAS distributed IP system architecture.

The ATLAS 8000 series platforms are based on a space efficient 1RU rack mount design that can be used to host interface and gateway solutions to inter-connect multiple types of systems through a common IP network. The ATLAS 8000 is available in several variants to meet specific integration needs.

THE ATLAS 8000 FEATURES INCLUDE:

- IP based and fully integrated into the ATLAS distributed architecture solutions
- Remote configuration, software upgrades, and fault reporting using the ATLAS Network Management System
- Rugged components designed for industrial use
- Low power consumption
- AC or DC power options
- Extra network ports (3) provided for future expansion and upgrades

SOFTWARE CONFIGURABLE OPTIONS

CONVENTIONAL AND TRUNKING SITE NETWORK INTERFACE

- Provides distributed call control and mobility management functions
- Ability to directly route calls between conventional and trunked systems and/or StarGate™ dispatch console without talkgroup patching

ANALOG GATEWAY

- Provides interoperability between StarGate console and legacy analog devices, 4-wire tone and E&M controlled equipment, and analog logging recorders

MOBILE RADIO GATEWAY

- Enables StarGate Console control of local control/base stations
- Eliminates intermediary devices by offering direct IP connections from the StarGate console
- Enables StarGate console to interface with multiple disparate systems including analog, P25 conventional/trunked, SMARTNET®/SmartZone®, and Multi-Net®

TECHNICAL DATA

Environmental and Physical	
Power Supply	100V AC or 12V DC Standard Optional 6V - 34V DC
Physical Dimesions (HxWxD)	1.75" x 19" x 10.25"
Weight	9.5 lbs.
Ports	Networking - 4 ports 10/100/1000 ethernet USB – 5 x USB 2.0 / 1.1 Serial – 1 x 9 pin RS232

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